Track Standard

INFRASTRUCTURE

Mobile Gang Work Instructions

I-PWY-1490

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Iarnród Éireann

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1.1 CHANGING RAILS IN CWR (RERAILING)

EQUIPMENT

Tape, Chalk, Pencil,
2 Disc Saws (with spare discs),
4 Power Spanners,
Shovels, Thermit Welding Gang,
10 Canting Bars (proper fitting),
Technical Cover, 6 Claw Bars,
Tirfer Winch, Clamp Spanner,
Mechanical Rail Threader (if available),
Signal & Telecoms Cover in Track-Circuited Area,
Rail Tensor Set

MATERIALS

New Clips, New Underpads,
New Shoulder Pads,
Sound Rail (of the same rail section),
Fishplates, Clamps,
Joggle Plates, Crank Plates (if required),
Lighting (if required),
Fuel for Power Tools

SAFETY ARRANGEMENTS

Personal Protective Equipment (PPE) Required

Safety Footwear, Hi-Visibility Clothing, Suitable Gloves

Additional PPE Requirements

Disc Saw Operators – flame-retardant overalls, spats, dust mask, goggles, ear defenders, suitable gloves

Power Spanner Operators – ear defenders

(These PPE requirements apply to all staff within 3 m of operator)

Minimum Warning Time (secs)

Not applicable

Protection Arrangements

TII protection for preparation,

TIII possession for rail changing activity.

Note: a temporary speed restriction (TSR) of 25 mph is required for a clamped rail.

Can traffic run on an adjacent track 6 ft away?

Yes, with lookout protection

RELATED WORK

(which may be carried out in conjunction with this work instruction but could require different protection arrangements)

Restressing.

Ultrasonic testing of welds and trolley testing after installation.

GENERAL INFORMATION

CWR: continuously welded rail.

The mobile gang complete the task in association with technical staff and Thermit welders.

All disc saw operators and power spanner operators MUST have attended the Small Plant and Equipment (SPE) Course.

Check the rail being installed is clear of visual defects.

The rail is offered up when cutting to size.

DO'S AND DON'TS

Do's

- Do use the canting bars to cant the rail.
- Do use proper ponies for moving the rail.
- Do make sure all materials and equipment are on site before starting work.
- Do use tensors before cutting rail to avoid jamming the disc saw or tearing the foot of the rail.

Don'ts

- Don't smoke near the welders' gas bottles – *do* be aware of hot materials and slag on the site.
- Don't look directly at the weld when it is tapped – *do* stand well clear of the weld area.
- Don't cut rails in stressed track if the rail temperature is over 23 °C.

1.1 CHANGING RAILS IN CWR (RERAILING)

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WORK METHOD

1. Identify the person in charge for the work group.
2. Impose a TSR of 25 mph.
3. Arrange protection.
4. Make sure the new rail is of adequate length and section.
5. Cut old rail into 108 m lengths initially.
6. Undo fastenings.
7. Cant old rail into the five foot.
8. Cant new rail into position.
9. Replace fastenings.
10. Allow suitable expansion gap at joints for temperature variation.
11. Tighten up fastenings.
12. Clamp joints.
13. Repeat steps 4–12 for further rails as required.
14. Use crank rail for closure (when required).

FUTURE FOLLOW-UP WORK

Welding, stressing, ultrasonic testing of welds.

Reinstating any level crossings and clearing materials.

Removing old rail from the five foot and cutting it up into 120 ft lengths for removal from the site.

Ballasting and tamping site.

Removing speed restriction and signing off on final inspection.

RELATED WORK INSTRUCTIONS

1.3 Transporting and Handling Rails Over Short Distances
1.4 Transporting and Handling Rails Using Rail Trolleys/On-Track Machines
1.5 Transporting and Handling Rails Using Winch Trucks
1.7 Rail Stressing Operations
9.3 Power Spanners
9.7 Rail Saws

INFRASTRUCTURE SAFETY STATEMENT REFERENCES

Refer to Infrastructure Safety Statement

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1.2 CHANGING RAILS IN JOINTED TRACK

EQUIPMENT

Tape, Chalk, Pencil, Drill, 1 Jack,

Disc Saw (with spare discs),

Hacksaw or Flame Cutting Equipment,

2 Fish Spanners or Impact Wrench or Power Spanner (and access to spare),

3 Canting Bars (proper fitting),

Key Hammer and Claw Bar (if bull-head rail)

MATERIALS

Sound Rail (of the same rail section),

Spare Fishplates, Spare Fishbolts,

Shims, Grease,

Fuel for Power Tools

SAFETY ARRANGEMENTS

Personal Protective Equipment (PPE) Required

Safety Footwear, Hi-Visibility Clothing, Suitable Gloves

Additional PPE Requirements

Disc Saw Operators – flame-retardant overalls, spats, dust mask, goggles, ear defenders, suitable gloves

Flame Cutting Operators – flame-retardant overalls, spats, spark-resistant gauntlets, flame cutting goggles, ear defenders

Power Spanner Operators – ear defenders

(These PPE requirements apply to all staff within 3 m of operator)

Minimum Warning Time (secs)

Not applicable

Protection Arrangements

TII or TIII possession

Can traffic run on an adjacent track 6 ft away?

Yes, with lookout protection

RELATED WORK

(which may be carried out in conjunction with this work instruction but could require different protection arrangements)

Changing fangbolts, sleepers or keys. Packing, shimming or greasing joints.

Visual inspection of adjacent joints for defects.

GENERAL INFORMATION

All disc saw operators and power spanner operators MUST have attended the Small Plant and Equipment (SPE) Course. All flame cutting operators MUST have attended the Cutting/Burning Course.

The rail that is being installed should have been ultrasonically tested and should be clear of visual defects.

Check the height of the rail to be installed is within 1 mm of the existing rail height.

If changing rails in older track, shim to restore top. Try to keep splice rails (freshly cut) together. The rail is offered up when cutting to size.

DO'S AND DON'TS

Do's

- Do use the canting bars to cant the rail.
- Do use proper ponies for moving the rail.
- Do check fishplates for cracks and then grease the fishing surfaces.
- Do replace any broken soleplates.
- Do permanently mark the rail if it is defective to prevent its future use by mistake.
- Do make sure all materials and equipment are on site before starting work.

Don'ts

- Don't put a crowbar in the fishbolt hole to cant the rail – *do* use the canting bars.
- Don't use flame cutting equipment when removing fangbolts if the rail is to be reused – *do* use a hacksaw.

1.2 CHANGING RAILS IN JOINTED TRACK

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WORK METHOD

Flat-Bottom Rail

1. Identify the person in charge for the work group.
2. Arrange protection.
3. Cut and make sure the new rail is of suitable length and similar height.
4. Remove fishbolts with fishbolt spanner, power spanner or impact wrench (and cutting equipment if necessary).
5. Cant new rail into the five foot.
6. Remove fangbolts on the five-foot side and slacken off the fangbolts on cess or six-foot side.
7. Cant out old rail to the cess.
8. Cant in new rail on to soleplates.
9. Equalise expansion gaps.
10. Fish-up and then fasten down fangbolts.

Bull-Head Rail

1. Identify the person in charge for the work group.
2. Arrange protection.
3. Cut and make sure the new rail is of suitable length and similar height.
4. Remove fishbolts with fishbolt spanner, power spanner or impact wrench (and cutting equipment if necessary).
5. Remove keys.
6. Lift rail up with claw bars and place 3 to 5 keys in chairs underneath the rail.
7. Bar the supported rail into the five foot.
8. Remove the supporting keys from the chairs.
9. Bar new rail into chairs with twisting motion.
10. Equalise expansion gaps.
11. Fish-up and then key-up.

FUTURE FOLLOW-UP WORK

The patrol ganger monitors fishbolt tightness during routine patrolling and re-tightens if required.

It is considered good practice and desirable to re-tighten fangbolts (especially on joints) a week after changing rails.

RELATED WORK INSTRUCTIONS

1.3 Transporting and Handling Rails Over Short Distances
1.4 Transporting and Handling Rails Using Rail Trolleys/On-Track Machines
1.5 Transporting and Handling Rails Using Winch Trucks
2.1 Lubrication of Rail Joints
2.2 Repair and Shimming of Rail Joints
2.3 Packing of Rail Joints
3.1 Replacing Fangbolt Fastenings on Timber Sleepers
9.1 Track Jacks
9.3 Power Spanners
9.7 Rail Saws

INFRASTRUCTURE SAFETY STATEMENT REFERENCES

Refer to Infrastructure Safety Statement

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1.3 TRANSPORTING AND HANDLING RAILS OVER SHORT DISTANCES

EQUIPMENT

Ponies:

2 for 30 ft rail 2 for 45 ft rail

3 for 60 ft rail 4 for 120 ft rail

(or new air braked trolleys),

Canting Bars (proper fitting and not worn),

Claw Bars

MATERIALS

Rails

SAFETY ARRANGEMENTS

Personal Protective Equipment (PPE) Required

Safety Footwear, Hi-Visibility Clothing, Suitable Gloves

Additional PPE Requirements

Not applicable

Minimum Warning Time (secs)

45 secs (see Table 1 in Appendix A)

Protection Arrangements

Lookout protection, or TII or TIII possession

Can traffic run on an adjacent track 6 ft away?

Yes, with lookout protection

RELATED WORK

(which may be carried out in conjunction with this work instruction but could require different protection arrangements)

Changing rails.

GENERAL INFORMATION

If the pony wheels have a flange on one side (Permaquip type), put the flange on the five-foot side of the rail so that it does not hit on bull-head chairs. *Note:* The newer Geismar type has a flange on both sides, so this does not apply.

The minimum number of staff required to move rails using the ponies are as follows:

- 45 ft rail or less requires 4 staff with 2 ponies (2 per pony)
- 60 ft rail requires 6 staff with 3 ponies (2 per pony)
- 120 ft rail requires 10 staff with 4 ponies (2 per pony with 3 per pony at either end)

Any rails of length greater than 120 ft should be moved by mechanical means and not by ponies.

Additional manpower is required where track is graded, canted or difficult underfoot.

If the rails are to be transported long distances, use rail trolleys.

DO'S AND DON'TS

Do's

- Do use the ponies to move the rails up from the end of the ballast if they are reachable.
- Do use a road/rail machine to move the rails if they are out of reach of the ponies.
- Do ensure that rails to be lifted are head-up and clear of stones and rail anchors before lifting.
- Do use the cess rail for ponying rails wherever possible.
- Do hold the rail steady with canting bars (or other support) when the clamps are removed.
- Do check that any rail left in the five foot is stable and at least 300 mm away from the running rail.

Don'ts

- Don't pony rails under traffic in locations where the cess is restricted by clearance or obstructions.
- Don't attempt to move rails using just 1 pony.
- Don't position end ponies less than 2 m from the end of the rail.
- Don't store rails in the five foot of a continuously track-circuited area.

1.3 TRANSPORTING AND HANDLING RAILS OVER SHORT DISTANCES

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WORK METHOD

1. Identify the person in charge who will control movements for the work group.
2. Arrange protection.
3. Select clamp location on the rail and clamp.
4. Lift rail evenly using ponies. If this is not possible, use a road/rail machine.
5. Push pony when instructed to do so by the person in charge.
6. Stop pony when instructed to do so by the person in charge.
7. Lower rail in a controlled manner, don't drop.
8. Hold rail steady with canting bars and remove clamps.
9. When all clamps are removed, cant rail to a safe storage location as instructed by the person in charge.

FUTURE FOLLOW-UP WORK

Not applicable

RELATED WORK INSTRUCTIONS

1.1 Changing Rails in CWR (Rerailing)
1.2 Changing Rails in Jointed Track
1.4 Transporting and Handling Rails Using Rail Trolleys/On-Track Machines
1.5 Transporting and Handling Rails Using Winch Trucks

INFRASTRUCTURE SAFETY STATEMENT REFERENCES

Refer to Infrastructure Safety Statement

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1.4 TRANSPORTING AND HANDLING RAILS USING RAIL TROLLEYS/ON-TRACK MACHINES

EQUIPMENT

Rail Trolleys,

On-Track Machine or Road/Railer (suitably braked) for Propulsion,

Canting Bars, Claw Bars

MATERIALS

Rails

SAFETY ARRANGEMENTS

Personal Protective Equipment (PPE) Required

Safety Footwear, Hi-Visibility Clothing, Suitable Gloves

Additional PPE Requirements

Not applicable

Minimum Warning Time (secs)

Not applicable

Protection Arrangements

TIII possession

Can traffic run on an adjacent track 6 ft away?

Only when working on the cess side (*not* the six-foot side)

RELATED WORK

(which may be carried out in conjunction with this work instruction but could require different protection arrangements)

Changing rails.

GENERAL INFORMATION

On canted track, it may be necessary for staff to stand on the rail trolley and use bars to keep the rail clear of the operator and the trolley during the lift.

The rail trolley must not exceed 25 mph.

Report any faults with the equipment to the inspector.

DO'S AND DON'TS

Do's

- Do ensure that rails to be lifted are head-up and clear of stones and rail anchors before lifting.
- Do check that ropes and equipment are in good order and that winches are operable before use.
- Do load evenly, placing rails on either side of the trolley alternately - *don't* load up one side first.
- Do distribute the load evenly over the bogies.

1.4 TRANSPORTING AND HANDLING RAILS USING RAIL TROLLEYS/ON-TRACK MACHINES

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WORK METHOD

Loading Rails

1. Identify the person in charge who will control movements for the work group, and also identify him/her to the on-track machine operator and the guard.
2. Arrange protection.
3. Prepare rail restraints on the trolley.
4. Set and adjust winches for lifting.
5. Place scissor grips properly on the head of the rail.
6. Lift and load rail according to instructions from the person in charge.
7. Secure rails with restraints.
8. When all rails are loaded, return winches to transit position and lock with pin.
9. The person in charge hands over charge of the train to the guard.

Unloading Rails

1. Identify the person in charge who will control movements for the work group, and also identify him/her to the on-track machine operator and the guard.
2. Arrange protection.
3. Undo rail restraints on trolley.
4. Set and adjust winches for lifting.
5. Place scissor grips properly on the head of the rail.
6. Lift and unload rail according to instructions from the person in charge.
7. Lower rail in a controlled manner, don't drop.
8. When all rails are unloaded, return winches to transit position and lock with pin.
9. The person in charge hands over charge of the train to the guard.

FUTURE FOLLOW-UP WORK

Not applicable

RELATED WORK INSTRUCTIONS

1.1 Changing Rails in CWR (Rerailing)
1.2 Changing Rails in Jointed Track
1.3 Transporting and Handling Rails Over Short Distances
1.5 Transporting and Handling Rails Using Winch Trucks
9.2 Hand-Propelled Per Way Trolleys

INFRASTRUCTURE SAFETY STATEMENT REFERENCES

Refer to Infrastructure Safety Statement

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1.5 TRANSPORTING AND HANDLING RAILS USING WINCH TRUCKS

EQUIPMENT

Winch Trucks, Loco,
Canting Bars, Claw Bars,
Podgers

MATERIALS

Rails, Fuel for Winch Motors

SAFETY ARRANGEMENTS

Personal Protective Equipment (PPE) Required

Safety Footwear, Hi-Visibility Clothing, Hard Hat, Suitable Gloves

Additional PPE Requirements

Winch Motor Operator – ear defenders

(This PPE requirement applies to all staff within 3 m of operator)

Minimum Warning Time (secs)

Not applicable

Protection Arrangements

TIII possession or
as an engineer's train in section (refer to the *Rule Book*)

Can traffic run on an adjacent track 6 ft away?

Only when working on the cess side (*not* the six-foot side)

RELATED WORK

(which may be carried out in conjunction with this work instruction but could require different protection arrangements)

Changing rails.

GENERAL INFORMATION

The use of winch trucks for loading and offloading rails must be in accordance with *IS 360:2004 Code of Practice for the Safe Use of Cranes in the Construction Industry*. Overall control of the crane operation is co-ordinated by a certified appointed **crane co-ordinator** who must establish a safe system of work for all stages of the winch truck operation when it is used in a crane mode. A method statement must be prepared in advance to take account of every stage of the operation.

On canted track, it may be necessary for staff to stand on the winch truck and use bars to keep the rail clear of the truck during the lift.

DO'S AND DON'TS

Do's

- Do ensure that rails to be lifted are head-up and clear of stones and rail anchors before lifting.
- Do check that ropes and equipment are in good order and that winches are operable before use.
- Do check that sufficient petrol and podgers are on site before commencing.
- Do check that the winch trucks have adequate stanchions to hold rails.
- Do ensure that rails are lifted evenly.
- Do ensure that rails loaded on the truck are properly shackled down with the chains.
- Do check before any train movements within the worksite that the cantilevers are not foul of any lineside structures, i.e. bridge abutments, gate posts etc.

Don'ts

- Don't load rails head-down on winch trucks.

1.5 TRANSPORTING AND HANDLING RAILS USING WINCH TRUCKS

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WORK METHOD

Unloading Rails

1. Identify the person in charge who will control movements for the work group, and also identify him/her to the loco driver and the guard.
2. Arrange protection.
3. In preparation, take out the stanchions on the winch side of the truck and leave them out of the way.
4. Separate the chains and lay them safely along the wagon.
5. Set winches for lifting using the adjustment screw so that the lifting end of the cantilever is lowered.
6. Place scissors grips properly on the head of the rail.
7. Lift rail according to instructions from the person in charge.
8. Winch rail across and lower in a controlled manner, don't drop.
9. When all rails are unloaded, return winches to transit position and lock with pin. Ensure that the extension to the cantilever is turned back inwards.
10. Replace stanchions.
11. Place chains in transit position.
12. The person in charge hands over charge of the train to the guard.

Loading Rails

1. Identify the person in charge who will control movements for the work group, and also identify him/her to the loco driver and the guard.
2. Arrange protection.
3. In preparation, take out the stanchions on the winch side of the truck and leave them out of the way.
4. Separate the chains and lay them safely along the wagon.
5. Set winches for lifting using the adjustment screw so that the lifting end of the cantilever is raised.
6. Place podgers as required on the truck in preparation for receiving the rails.
7. Place scissors grips properly on the head of the rail.
8. Lift rail according to instructions from the person in charge.
9. Winch rail across and lower onto podgers.
10. When all rails are loaded, return winches to transit position and lock with pin. Ensure that the extension to the cantilever is turned back inwards.
11. Replace stanchions.
12. Secure rails with chains.
13. The person in charge hands over charge of the train to the guard.

FUTURE FOLLOW-UP WORK

Not applicable

RELATED WORK INSTRUCTIONS

1.1 Changing Rails in CWR (Rerailing)
1.2 Changing Rails in Jointed Track
1.3 Transporting and Handling Rails Over Short Distances
1.4 Transporting and Handling Rails Using Rail Trolleys/On-Track Machines

INFRASTRUCTURE SAFETY STATEMENT REFERENCES

Refer to Infrastructure Safety Statement

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1.6 THE USE OF CRANK RAILS IN JOINTED TRACK

EQUIPMENT

Disc Saw (with spare discs) or
use the Welding Gang,
Fish Spanners, Drill,
Templates for Boring,
Canting Bars, Claw Bars,
Power Spanner,
Tape Measure, Chalk

MATERIALS

Crank Rail (of the right poundage),
Fastenings, Sleepers,
Soleplates (of different types, as required),
Fuel for Power Tools

SAFETY ARRANGEMENTS

Personal Protective Equipment (PPE) Required

Safety Footwear, Hi-Visibility Clothing, Suitable Gloves

Additional PPE Requirements

Disc Saw Operators – flame-retardant overalls, spats, dust mask, goggles, ear defenders, suitable gloves

Power Spanner Operators – ear defenders

Rail Drill Operators – goggles, ear defenders

Sleeper Boring Machine Operators – goggles, ear defenders

(These PPE requirements apply to all staff within 3 m of operator)

Minimum Warning Time (secs)

Not applicable

Protection Arrangements

TII or TIII possession

Can traffic run on an adjacent track 6 ft away?

Yes, with lookout protection

RELATED WORK

(which may be carried out in conjunction with this work instruction but could require different protection arrangements)

Transporting and handling rails.

GENERAL INFORMATION

Prepare for the job by accessing the site prior to work and measuring up.

Replace sleepers if rotten or re-bore if satisfactory.

Crank rails should be transported to the site and handled in a controlled manner (e.g. using winch trucks).

Make sure the crank rails are placed out the correct way round.

All disc saw operators, rail drill operators and power spanner operators MUST have attended the Small Plant and Equipment (SPE) Course.

DO'S AND DON'TS

Do's

- Do have the crank rail ultrasonically tested prior to installation.
- Do visually examine rail for defects prior to installation.
- Do carry out a careful visual examination of the crank rail to ensure the ground running edge is placed correctly.
- Do make sure that the weld is at least 4.5 m from any joint and that sleepers are located 300 mm either side of the weld.

1.6 THE USE OF CRANK RAILS IN JOINTED TRACK

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WORK METHOD

1. Identify the person in charge for the work group.
2. Arrange protection.
3. Make sure the crank rail is of adequate length and section.
4. Cant new rail into the five foot.
5. Cut out old rail using disc saw or welding gang.
6. Undo fastenings.
7. Cant old rail to the cess.
8. Offer up new rail and cut to size.
9. Cant new rail into position.
10. Equalise expansion joints.
11. Fish-up and then fasten down.

FUTURE FOLLOW-UP WORK

Gauge to be checked following installation.

The patrol ganger checks fastenings are secure after installation, and monitors the site.

RELATED WORK INSTRUCTIONS

1.3 Transporting and Handling Rails Over Short Distances
1.4 Transporting and Handling Rails Using Rail Trolleys/On-Track Machines
1.5 Transporting and Handling Rails Using Winch Trucks
9.3 Power Spanners
9.7 Rail Saws
9.8 Rail Drills

INFRASTRUCTURE SAFETY STATEMENT REFERENCES

Refer to Infrastructure Safety Statement

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1.7 RAIL STRESSING OPERATIONS

EQUIPMENT

Bottom Rollers with Extended Arm (side rollers if stressing a curve),

Geismar Lifters, Fangbolt Spanner,

Joggle Plates and Clamps,

5 Power Spanners (minimum),

Welding Gang, Disc Saw (with spare discs) if appropriate,

Adjusting Spanner for Rail Fastenings,

Rail Thermometers, Rail Tensors

MATERIALS

New Rail Pads, Spare Clips,

Access to a Spare Piece of Rail (same poundage),

Fuel for Power Tools

SAFETY ARRANGEMENTS

Personal Protective Equipment (PPE) Required

Safety Footwear, Hi-Visibility Clothing, Suitable Gloves

Additional PPE Requirements

Power Spanner Operators – ear defenders

(This PPE requirement applies to all staff within 3 m of operator)

Minimum Warning Time (secs)

Not applicable

Protection Arrangements

TIII possession

Can traffic run on an adjacent track 6 ft away?

Yes, with lookout protection

RELATED WORK

(which may be carried out in conjunction with this work instruction but could require different protection arrangements)

Changing rails, sleepers, insulated joints, fastenings etc.

GENERAL INFORMATION

All disc saw operators and power spanner operators MUST have attended the Small Plant and Equipment (SPE) Course.

Make sure the correct shoe and clip is on the power spanner.

Know where a spare rail is located in case a weld fails.

Torque the screws correctly with the power spanner (250 N) and check with a torque spanner (provided by fitter).

Rollers are positioned in accordance with the *Maintenance of Way Handbook MW19*.

Any spare rail should be put to the cess pending removal.

DO'S AND DON'TS

Do's

- Do assist the welders in moving the welding gear (if staff available).
- Do ensure that all rollers are picked up when clearing the site.
- Do use tensors before cutting rail to avoid jamming the disc saw or tearing the foot of the rail.

Don'ts

- Don't stress track if rail temperature is above 23 °C and rising.
- Don't put hands or fingers under the rail at any time.
- Don't unclip before cutting the rail.
- Don't use bottom rollers (under-rollers) without extended side handles. Only use bottom rollers with extended arm.
- Don't look directly at the weld when it is tapped (poured) – *do* stand well clear of the weld area.
- Don't smoke near the welders' gas bottles – *do* be aware of hot materials and slag on the site.
- Don't take out the side rollers until the rail is secured.

1.7 RAIL STRESSING OPERATIONS

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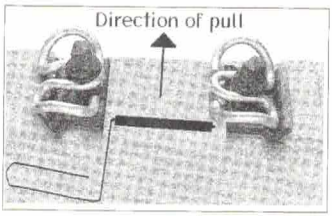
WORK METHOD

1. Identify the person in charge for the work group (mobile gang and welding gang).
2. Arrange protection.
3. Distribute bottom rollers for both rails at a rate of 1 every 6 sleepers for curved track and 1 every 10 sleepers for straight track.
4. If track is curved, distribute side rollers at a rate of 1 every 10 sleepers for the rail on the inside of the curve (low rail) and 1 every 30 sleepers for the rail on the outside of the curve (high rail), ensuring a 3-sleeper stagger across the five-foot way.
5. Lay out tensors at the location where the initial welds are to be made.
6. Cut rail using welding gang (or disc saw if rail has already been cut and is not in compression).
7. Undo fastenings starting from cut or free end.
8. Lift rails clear of obstructions (particularly at glued joints) using the Geismar rail lifters and ensure free movement of the rail.
9. Position the bottom rollers (and side rollers if used) on the sleepers at the frequencies described above. Bottom rollers are to be placed with the handle in the position as shown below.



10. The rail is now stressed by hydraulic tensors under the supervision of technical staff.
11. When technical staff are satisfied that the rail is correctly stressed, the person in charge instructs staff to remove rollers and fasten down.
12. Remove redundant materials and tidy the site.

FUTURE FOLLOW UP WORK

Ultrasonic testing of stressed welds is to be carried out following stressing and before the temporary speed restriction (TSR) is removed.

RELATED WORK INSTRUCTIONS

1.1 Changing Rails in CWR (Rerailing)
1.3 Transporting and Handling Rails Over Short Distances
1.8 Repairs to Rails in CWR
2.4 Repair and Changing of Insulated Joints
9.3 Power Spanners
9.7 Rail Saws

INFRASTRUCTURE SAFETY STATEMENT REFERENCES

Refer to Infrastructure Safety Statement

Iarnród Éireann

1.8 REPAIRS TO RAILS IN CWR

EQUIPMENT

Tape, Chalk, Pencil, Shovels,

2 Disc Saws (with spare discs),

Impact Wrench or Power Spanner (and access to spare),

Canting Bars (proper fitting),

Thermit Welding Gang, Technical Cover,

Joggle Plates, Rail Thermometers,

Signal & Telecoms Cover in Track-Circuited Area,

Rail Tensors

MATERIALS

Sound Rail (of the same rail section),

Spare Fishplates, Spare Fishbolts,

Clamp Plates, Fuel for Power Tools,

Lighting (if required)

SAFETY ARRANGEMENTS

Personal Protective Equipment (PPE) Required

Safety Footwear, Hi-Visibility Clothing, Suitable Gloves

Additional PPE Requirements

Disc Saw Operators – flame-retardant overalls, spats, dust mask, goggles, ear defenders, suitable gloves

Power Spanner Operators – ear defenders

(These PPE requirements apply to all staff within 3 m of operator)

Minimum Warning Time (secs)

Not applicable

Protection Arrangements

TII or TIII possession

Can traffic run on an adjacent track 6 ft away?

Yes, with lookout protection

RELATED WORK

(which may be carried out in conjunction with this work instruction but could require different protection arrangements)

Restressing. Tamping. Ultrasonic testing of welds.

GENERAL INFORMATION

CWR: continuously welded rail.

The mobile gang complete the task in association with technical staff and Thermit welders.

All disc saw operators and power spanner operators MUST have attended the Small Plant and Equipment (SPE) Course.

Check the rail being installed is clear of visual defects and has been ultrasonically tested.

The rail is offered up when cutting to size.

DO'S AND DON'TS

Do's

- Do use the canting bars to cant the rail.
- Do use proper ponies for moving the rail.
- Do make sure all materials and equipment are on site before starting work.
- Do use tensors before cutting rail to avoid jamming the disc saw or tearing the foot of the rail.

Don'ts

- Don't smoke near the welders' gas bottles – *do* be aware of hot materials and slag on the site.
- Don't look directly at the weld when it is tapped – *do* stand well clear of the weld area.
- Don't cut rails in stressed track if the rail temperature is over 23 °C.

1.8 REPAIRS TO RAILS IN CWR

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WORK METHOD

1. Identify the person in charge for the work group (mobile gang and welding gang).
2. Arrange protection.
3. Make sure the stress holding equipment tensors are in position and the rails marked up.
4. Make sure the new rail is of adequate length and section.
5. Cant new rail into the five foot.
6. Cut old rail using disc saw, or use the welding gang.
7. Undo fastenings.
8. Cant old rail to the cess.
9. Offer up new rail for welders to cut to size.
10. Cant new rail into position.
11. Fasten down.
12. Assist welders in moving equipment (if staff available).
13. Welds must be ultrasonically tested as soon as weld cools.

FUTURE FOLLOW-UP WORK

Ensure ballast is boxed in and pads and clips are replaced as necessary.

RELATED WORK INSTRUCTIONS

1.3 Transporting and Handling Rails Over Short Distances
1.4 Transporting and Handling Rails Using Rail Trolleys/On-Track Machines
1.5 Transporting and Handling Rails Using Winch Trucks
1.7 Rail Stressing Operations
9.3 Power Spanners
9.7 Rail Saws

INFRASTRUCTURE SAFETY STATEMENT REFERENCES

Refer to Infrastructure Safety Statement

Iarnród Éireann

2.1 LUBRICATION OF RAIL JOINTS

EQUIPMENT

Fishbolt Spanner, Hammer,
Jack, Shovel, Hack, Sledge,
Wire Brush, Bars, G-Clamp (standby),
Scraper (for removing hardened grease),
Flame Cutting Equipment (standby for removing stubborn bolts)

MATERIALS

Grease, Shims,
Spare Fishbolts, Spare Fishplates,
Barrier Cream

SAFETY ARRANGEMENTS

Personal Protective Equipment (PPE) Required

Safety Footwear, Hi-Visibility Clothing, Suitable Gloves

Additional PPE Requirements

Flame Cutting Operators – flame-retardant overalls, spats, spark-resistant gauntlets, flame cutting goggles, ear defenders

Nominated Grease Applicator – oil-resistant gloves

All Staff – barrier cream available (if required)

Minimum Warning Time (secs)

Not applicable

Protection Arrangements

TII or TIII possession

Can traffic run on an adjacent track 6 ft away?

Yes, with lookout protection

RELATED WORK

(which may be carried out in conjunction with this work instruction but could require different protection arrangements)

Repair and packing of joints.

GENERAL INFORMATION

This work is undertaken in springtime in preparation for the extreme variation in temperature that can occur during summer, i.e. hot days and cold nights.

It is preferable to carry out the shimming of rail joints in conjunction with lubrication and packing.

Flame Cutting Operators MUST have attended the Cutting/Burning Course.

DO'S AND DON'TS

Do's

- Do nominate a person within the work group to apply the grease and ensure they have oil-resistant gloves.
- Do make sure that bond wires are not trapped or broken.

Don'ts

- Don't put grease everywhere, just on the fishing surfaces.
- Don't reuse fishplates if broken or with visual defect.

2.1 LUBRICATION OF RAIL JOINTS

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WORK METHOD

1. Identify the person in charge for the work group.
2. Arrange protection.
3. Check that sufficient spare materials and equipment are on site before starting.
4. Slacken off each of the fishbolts.
5. Take out the fishbolts and remove the fishplates.
6. Clean off any hardened grease on the fishplates or on the rail around the fishbolt holes with the scraper.
7. Scrub the fishplate and the rail around the fishbolt holes with the wire brush.
8. Inspect both the fishplate and the rail around the fishbolt holes for cracks.
9. Put plenty of grease on the fishing surfaces of the rail (not on the fishplates).
10. Offer up the fishplates for refitting.
11. Fit the 2 middle fishbolts first and tighten to an average person's torque.
12. Fit the remaining bolts and tighten to an average person's torque.

FUTURE FOLLOW-UP WORK

Check fishplates and fishbolts every day for at least 3 days after work is completed.
The patrol ganger monitors joints and tightens bolts as required.
Adjust expansions if required.

RELATED WORK INSTRUCTIONS

2.2 Repair and Shimming of Rail Joints
2.3 Packing of Rail Joints
9.1 Track Jacks

INFRASTRUCTURE SAFETY STATEMENT REFERENCES

Refer to Infrastructure Safety Statement

Iarnród Éireann

2.2 REPAIR AND SHIMMING OF RAIL JOINTS

EQUIPMENT

Fishbolt Spanner, Hammer,
Jack, Shovel, Hack, Sledge,
Wire Brush, Bars, G-Clamp (standby),
Scraper (for removing hardened grease),
Power Spanner (and access to spare),
Tapered Gauge,
Straight Edge (1-metre long)

MATERIALS

Grease, Shims,
Spare Fishbolts, Spare Fishplates,
Barrier Cream, Fuel for Power Tools

SAFETY ARRANGEMENTS

Personal Protective Equipment (PPE) Required

Safety Footwear, Hi-Visibility Clothing, Suitable Gloves

Additional PPE Requirements

Power Spanner Operators – ear defenders

(This PPE requirement applies to all staff within 3 m of operator)

Nominated Grease Applicator – oil-resistant gloves

All Staff – barrier cream available (if required)

Minimum Warning Time (secs)

Not applicable

Protection Arrangements

TII or TIII possession

Can traffic run on an adjacent track 6 ft away?

Yes, with lookout protection

RELATED WORK

(which may be carried out in conjunction with this work instruction but could require different protection arrangements)

Packing and joint lubrication.

GENERAL INFORMATION

All power spanner operators MUST have attended the Small Plant and Equipment (SPE) Course.

Shims come in sizes of 5–15 but sizes 7 and 9 are normally adequate. If a shim larger than size 11 is required, the rail should be considered for changing.

It is preferable to carry out the lubrication of rail joints in conjunction with shimming and packing.

DO'S AND DON'TS

Do's

- Do nominate a person within the work group to apply the grease and ensure they have oil-resistant gloves.
- Do look for cracks in fishplates and replace if broken or with visual defect.
- Do examine rail ends and bolt holes for cracks.

Don'ts

- Don't put grease everywhere, just on the fishing surfaces.
- Don't over-shim the joint, seek guidance from the person in charge.
- Don't shim a joint which is marked up with a number 2 ultrasonic rail defect.

2.2 REPAIR AND SHIMMING OF RAIL JOINTS

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WORK METHOD

1. Identify the person in charge for the work group.
2. Arrange protection.
3. Check that sufficient spare materials and equipment are on site before starting.
4. Using the straight edge and tapered gauge, measure for shim size 12 mm from the end of the rail.
5. Slacken off each of the fishbolts.
6. Take out the fishbolts and remove the fishplates (not necessary with the new type of shims).
7. Clean off any hardened grease on the fishplates or on the rail around the fishbolt holes with the scraper.
8. Scrub the fishplate and the rail around the fishbolt holes with the wire brush.
9. Inspect both the fishplate and the rail around the fishbolt holes for cracks.
10. Put plenty of grease on the fishing surfaces of the rail (not on the fishplates).
11. Install shims.
12. Offer up the fishplates for refitting.
13. Fit the 2 middle fishbolts first and tighten to an average person's torque.
14. Fit the remaining bolts and tighten to an average person's torque.
15. The joint should be soundly packed (see Work Instruction 2.3).

FUTURE FOLLOW-UP WORK

Check fishplates and fishbolts every day for at least 3 days after work is completed.
The patrol ganger monitors joints and tightens bolts as required.

RELATED WORK INSTRUCTIONS

2.1 Lubrication of Rail Joints
2.3 Packing of Rail Joints
9.1 Track Jacks
9.3 Power Spanners

INFRASTRUCTURE SAFETY STATEMENT REFERENCES

Refer to Infrastructure Safety Statement

Iarnród Éireann

2.3 PACKING OF RAIL JOINTS

EQUIPMENT

Fishbolt Spanner, Shovel, Hack, Bars,
2 x Jacks (minimum),
Hand-Held Power Tamping Tools,
Beater, Crosslevel Gauge

MATERIALS

Grease, Shims,
Spare Fishbolts, Spare Fishplates,
Fangbolts (if applicable),
Fuel for Power Tools

SAFETY ARRANGEMENTS

Personal Protective Equipment (PPE) Required

Safety Footwear, Hi-Visibility Clothing, Suitable Gloves

Additional PPE Requirements

Beater Operators – goggles

Power Tamping Tool Operators – goggles, ear defenders

(These PPE requirements apply to all staff within 3 m of operators)

Minimum Warning Time (secs)

25 secs for shovel or beater packing (see Table 1 in Appendix A)

Otherwise, TII or TIII possession required for operation of power tamping tools

Protection Arrangements

TII or TIII possession.

Lookout protection is permissible for shovel or beater packing.

Can traffic run on an adjacent track 6 ft away?

Yes, with lookout protection

RELATED WORK

(which may be carried out in conjunction with this work instruction but could require different protection arrangements)

Checking fishbolts are in order and replacing as necessary.

GENERAL INFORMATION

Packing must not take place in hot weather, i.e. above a rail temperature of 32 °C.

When packing joints on curves, pay particular attention to maintaining the geometry (including cant).

DO'S AND DON'TS

Do's

- Do look for cracks in fishplates and replace if broken or with visual defect.
- Do examine rail ends for cracks.
- Do use the low rail as the datum rail on curves.
- Do take care on curves to maintain the super-elevation (cant) – use the crosslevel gauge.
- Do use two jacks to lift both rails simultaneously if the joint is adjacent on both rails. Using one jack to lift the rails independently may only be done at staggered joints as this method introduces a twist to the track.

2.3 PACKING OF RAIL JOINTS

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WORK METHOD

1. Identify the person in charge for the work group.
2. Arrange protection.
3. Dig out any dirty ballast, dispose of it clear of the track and replace with clean.
4. Lift both rails to level simultaneously if the joint is adjacent. If the joint is staggered, lift one rail to level and pack followed by the other rail.
5. Pack ballast firmly both sides of the sleeper using the shovel and power tamping tool or beater packer.
6. Box in sleepers with ballast.
7. Clear and tidy the site.

FUTURE FOLLOW-UP WORK

If possible, check the joint for broken fishplates after the first train has passed (or the following day).

RELATED WORK INSTRUCTIONS

2.1 Lubrication of Rail Joints

2.2 Repair and Shimming of Rail Joints

9.1 Track Jacks

9.4 Hand-Held Power Tamping Tools

INFRASTRUCTURE SAFETY STATEMENT REFERENCES

Refer to Infrastructure Safety Statement

Iarnród Éireann

2.4 REPAIR AND CHANGING OF INSULATED JOINTS

EQUIPMENT

2 x Baskets, Bar, Fish Wrench,
Jack, Sledge, Shovels,
Hack, File, Brush,
Power Spanner (and access to spare),
Rail Creep Adjuster, Bogie (if required),
Access to Flame Cutting Equipment,
Hand-Held Power Tamping Tool or Beater

MATERIALS

T-piece (Endpost), Spare Fishbolts,
Fuel for Power Tools

SAFETY ARRANGEMENTS

Personal Protective Equipment (PPE) Required

Safety Footwear, Hi-Visibility Clothing, Suitable Gloves

Additional PPE Requirements

Beater Operators – goggles

Flame Cutting Operators – flame-retardant overalls, spats, spark-resistant gauntlets, flame cutting goggles, ear defenders

Power Spanner Operators – ear defenders

Power Tamping Tool Operators – goggles, ear defenders

(These PPE requirements apply to all staff within 3 m of operators)

Minimum Warning Time (secs)

Not applicable

Protection Arrangements

TII or TIII possession

Can traffic run on an adjacent track 6 ft away?

Yes, with lookout protection

RELATED WORK

(which may be carried out in conjunction with this work instruction but could require different protection arrangements)

Packing the joint. Changing sleepers.

GENERAL INFORMATION

Ensure that chairs are not touching, or in danger of touching, fishplates on bull-head track. Pull back sleepers if necessary.

All power spanner operators MUST have attended the Small Plant and Equipment (SPE) Course.

All flame cutting operators MUST have attended the Cutting/Burning Course.

DO'S AND DON'TS

Do's

- Do check rail for bolt hole defects or cracks when joint is disassembled.
- Do try to avoid damaging the thread of fishbolts when removing them by putting the bolt back on the screw before hitting the fishbolt with a hammer.

2.4 REPAIR AND CHANGING OF INSULATED JOINTS

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WORK METHOD

1. Identify the person in charge for the work group.
2. Arrange protection.
3. Check the right materials for the job are on site.
4. Loosen and remove fishbolts (cut out if required).
5. Remove fishplates and insulators and check fishplates for defects.
6. Check rail ends and bolt holes for defects.
7. If rail-lipping is present, remove with file and brush away filings.
8. Reassemble joints with sound fishplates, fishbolts and new insulators and T-pieces.
9. Tighten up fishbolts.
10. Re-check insulators are in correct position.
11. Profile T-piece to suit rail head with file.
12. Pack joint as required.
13. Check joint after traffic.

FUTURE FOLLOW-UP WORK

The patrol ganger monitors joints and tightness of bolts.

RELATED WORK INSTRUCTIONS

2.3 Packing of Rail Joints
3.1 Replacing Fangbolt Fastenings on Timber Sleepers
3.2 Manual Replacement of Timber Sleepers
9.1 Track Jacks
9.3 Power Spanners
9.4 Hand-Held Power Tamping Tools

INFRASTRUCTURE SAFETY STATEMENT REFERENCES

Refer to Infrastructure Safety Statement

Iarnród Éireann

2.5 MAINTENANCE AND CHANGING OF GLUED JOINTS

EQUIPMENT

Tape, Chalk, Pencil,

2 x Disc Saws (with spare discs), Shovels,

Impact Wrench or Power Spanner (and access to spare),

Thermit Welding Gang, Technical Cover,

Canting Bars (proper fitting),

6 x Claw Bars, Tirfer,

Joggle Plates, Rail Thermometer,

Clamp Spanner, Beater,

Hand-Held Power Tamping Tool, Tensors,

Signals & Telecoms Cover in Track-Circuited Area

MATERIALS

Glued Joint (for installation),

Fuel for Power Tools

SAFETY ARRANGEMENTS

Personal Protective Equipment (PPE) Required

Safety Footwear, Hi-Visibility Clothing, Suitable Gloves

Additional PPE Requirements

Beater Operators – goggles

Disc Saw Operators – flame-retardant overalls, spats, dust mask, goggles, ear defenders, suitable gloves

Power Spanner Operators – ear defenders

Power Tamping Tool Operators – goggles, ear defenders

(These PPE requirements apply to all staff within 3 m of operators)

Minimum Warning Time (secs)

Not applicable

Protection Arrangements

TII or TIII possession

Can traffic run on an adjacent track 6 ft away?

Yes, with lookout protection

RELATED WORK

(which may be carried out in conjunction with this work instruction but could require different protection arrangements)

Tamping and packing (Cobra or equivalent).

GENERAL INFORMATION

All disc saw operators and power spanner operators MUST have attended the Small Plant and Equipment (SPE) Course.

Take care when handling the glued joint.

Joint maintenance is undertaken by ensuring that glued joints are well packed.

DO'S AND DON'TS

Do's

- Do use tensors before cutting rail to avoid jamming the disc saw or tearing the foot of the rail.

Don'ts

- Don't change rails in stressed track if the rail temperature is over 23 °C.
- Don't look directly at the weld when it is tapped – *do* stand well clear of the weld area.
- Don't smoke near the welders' gas bottles – *do* be aware of hot materials and slag on the site.

2.5 MAINTENANCE AND CHANGING OF GLUED JOINTS

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WORK METHOD

Changing a Glued Joint

1. Identify the person in charge for the work group.
2. Arrange protection.
3. Make sure the stress holding equipment tensors are in position and the rails marked up.
4. Check the new rail with the glued joint is the correct way round.
5. Make sure the new rail with the glued joint is of adequate length and section.
6. Cut out the old rail and glued joint.
7. Undo fastenings.
8. Cant old rail to the cess, and clear of Signal & Telecoms equipment.
9. Cant new rail with glued joint into position and restress if required.
10. Replace fastenings and tighten up.
11. Clamp joints.
12. Weld up the rail and ultrasonically test as soon as the weld cools.
13. Clear and tidy the site.

FUTURE FOLLOW-UP WORK

Remove old rail and glued joint from the site.

RELATED WORK INSTRUCTIONS

1.3 Transporting and Handling Rails Over Short Distances
1.4 Transporting and Handling Rails Using Rail Trolleys/On-Track Machines
1.7 Rail Stressing Operations
9.3 Power Spanners
9.4 Hand-Held Power Tamping Tools
9.7 Rail Saws

INFRASTRUCTURE SAFETY STATEMENT REFERENCES

Refer to Infrastructure Safety Statement

Iarnród Éireann

3.1 REPLACING FANGBOLT FASTENINGS ON TIMBER SLEEPERS

EQUIPMENT

Power Spanner and/or T-Spanner and/or Fang Spanner,

Hacksaw, Claw Bar, Sledge, Hack, Shovel,

Jack, Secondary Support,

Angle Grinder or Flame Cutting Equipment may be required

MATERIALS

Fangbolts,

Fuel for Power Tools

SAFETY ARRANGEMENTS

Personal Protective Equipment (PPE) Required

Safety Footwear, Hi-Visibility Clothing, Suitable Gloves

Additional PPE Requirements

Angle Grinder Operators – flame-retardant overalls, spats, dust mask, goggles, ear defenders, suitable gloves

Flame Cutting Operators – flame-retardant overalls, spats, spark-resistant gauntlets, flame cutting goggles, ear defenders

Power Spanner Operators – ear defenders

(These PPE requirements apply to all staff within 3 m of operators)

Minimum Warning Time (secs)

25 secs (see Table 1 in Appendix A)

Protection Arrangements

Lookout protection, TII or TIII possession, or Section S of the *Rule Book* as appropriate

Can traffic run on an adjacent track 6 ft away?

Yes, with lookout protection

RELATED WORK

(which may be carried out in conjunction with this work instruction but could require different protection arrangements)

Replacing sleepers.

GENERAL INFORMATION

All angle grinder operators MUST have attended the Angle Grinder Course.

All flame cutting operators MUST have attended the Cutting/Burning Course.

All power spanner operators MUST have attended the Small Plant and Equipment (SPE) Course.

Check sufficient replacement materials and equipment are at the site before removing existing fangbolts.

DO'S AND DON'TS

Do's

- Do ensure the person crabbing is wearing gloves.
- Do use a secondary support to the jack (e.g. timber blocks, sleeper offcuts).
- Do ensure everyone is clear of the rail before the jack is released.

Don'ts

- Don't over-lift the track.

3.1 REPLACING FANGBOLT FASTENINGS ON TIMBER SLEEPERS

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WORK METHOD

1. Identify the person in charge for the work group.
2. Arrange protection.
3. Identify fangbolt(s) to be replaced with the power spanner and check the new fangbolt(s) are of correct type.
4. Remove old fangbolts with power spanner/T-spanner/fang spanner, or hacksaw if the bolt spins.
5. Dig out underneath the sleeper; remove sufficient ballast to allow access to the fangbolt. Remove/dislodge old crab.
6. Jack the track and insert secondary support.
7. Clean out the fangbolt hole. If the bolt won't loosen, cut the head with the hacksaw and remove the stump of bolt. Remove the stump of bolt with the claw bar if the hacksaw was used.
8. Insert the new fangbolt and crab.
9. Tighten fangbolts and ensure the crab is biting using the shovel or claw bar.
10. Take out the secondary support and release the jack.
11. Consolidate ballast in the area where the fangbolt is being replaced.
12. Box in sleeper(s) with ballast.
13. Clean and tidy the site.

FUTURE FOLLOW-UP WORK

Re-tighten fangbolts using a half turn each time.

RELATED WORK INSTRUCTIONS

3.2 Manual Replacement of Timber Sleepers
9.1 Track Jacks
9.3 Power Spanners

INFRASTRUCTURE SAFETY STATEMENT REFERENCES

Refer to Infrastructure Safety Statement

Iarnród Éireann

3.2 MANUAL REPLACEMENT OF TIMBER SLEEPERS

EQUIPMENT

Hack, Hammer, Sledge,
Bar, Shovel, Hacksaw,
Auger, Bogie, Beater,
2 x Jacks, Jack Handles, Secondary Support,
Sleeper Tongs, Impact Wrench, Track Gauge,
Power Spanner (and access to spare),
Hand-Held Power Tamping Tool,
Access to Flame Cutting Equipment

MATERIALS

Fangbolts (mushroom-head for flat-bottom and square-head for bull-head),
Replacement Sleepers,
4-Hole Soleplates (if necessary),
Fuel for Power Tools

SAFETY ARRANGEMENTS

Personal Protective Equipment (PPE) Required

Safety Footwear, Hi-Visibility Clothing, Suitable Gloves

Additional PPE Requirements

Beater Operators – goggles

Flame Cutting Operators – flame-retardant overalls, spats, spark-resistant gauntlets, flame cutting goggles, ear defenders

Power Spanner Operators – ear defenders

Power Tamping Tool Operators – goggles, ear defenders

(These PPE requirements apply to all staff within 3 m of operators)

Minimum Warning Time (secs)

Not applicable

Protection Arrangements

TII or TIII possession

Can traffic run on an adjacent track 6 ft away?

Yes, with lookout protection

RELATED WORK

(which may be carried out in conjunction with this work instruction but could require different protection arrangements)

Packing. Renewing soleplates. Correcting gauge.

GENERAL INFORMATION

All flame cutting operators MUST have attended the Cutting/Burning Course.

All power spanner operators MUST have attended the Small Plant and Equipment (SPE) Course.

Check sufficient replacement materials and equipment are on site before removing existing fastenings.

This work should not be carried out when rail temperature exceeds 32 °C.

DO'S AND DON'TS

Do's

- Do use a secondary support to the jack (e.g. fishplate, soleplate etc.) so that hands are not trapped should the jack fail or be released in error.
- Do ensure everyone is clear of the rail before the jack is released.
- Do preserve super-elevation on curves.
- Do ensure the person crabbing is wearing gloves.

Don'ts

- Don't pack until the jacks have been released.
- Don't over-lift the track.

3.2 MANUAL REPLACEMENT OF TIMBER SLEEPERS

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WORK METHOD

General Preliminary

1. Identify the person in charge for the work group and arrange protection.
2. Identify and dig out the box alongside the sleeper to be replaced.
3. Ensure there is sufficient space to pull out old sleeper and insert new sleeper.
4. Remove fastenings using the power spanner or the hacksaw.

In Bull-Head or Baseplated Track

1. Jack the track on both rails so that the chairs/baseplates are clear of the sleeper. Chairs/baseplates can be moved along the rail if required.
2. Insert secondary support under rail (e.g. fishplate, soleplate).
3. Move the old sleeper clear of the track using sleeper tongs.
4. Attend to the sleeper bed as required.
5. Replace defective chairs/baseplates as necessary.
6. Install new sleepers; mount and fly up the chairs; mount and clip up the baseplates.
7. Check and, if necessary, adjust the rail gauge.
8. Install and secure new fastenings into chairs/baseplates and sleepers.
9. Take out the secondary support and drop the jacks.
10. Tighten fastenings.
11. Pack the sleeper to restore top.
12. Box in sleeper(s) with ballast.
13. Clean and tidy the site.

In Soleplated Track

1. Jack the track on both rails so it is clear of soleplates.
2. Insert the secondary support under rail (e.g. fishplate, soleplate).
3. Move the old sleeper clear of track using sleeper tongs.
4. Attend to the sleeper bed as required.
5. Retrieve the soleplates (reuse if serviceable).
6. Install new sleepers and soleplates, and bore if necessary.
7. Check and, if necessary, adjust the rail gauge.
8. Install and secure new fastenings into the soleplates and sleepers.
9. Take out the secondary support and drop the jacks.
10. Tighten fastenings.
11. Pack the sleeper to restore top.
12. Box in sleeper(s) with ballast.
13. Clean and tidy the site.

FUTURE FOLLOW-UP WORK

Monitor top and re-tighten fastenings.

RELATED WORK INSTRUCTIONS

3.1 Replacing Fangbolt Fastenings on Timber Sleepers
4.5 Manual Packing of Older Type Common Crossings
5.2 Mucky and Wet Spot Treatment
6.2 Correcting Gauge Faults
9.1 Track Jacks
9.3 Power Spanners
9.4 Hand-Held Power Tamping Tools

INFRASTRUCTURE SAFETY STATEMENT REFERENCES

Refer to Infrastructure Safety Statement

Iarnród Éireann

4.1 CHANGING OLDER TYPE COMMON CROSSINGS

EQUIPMENT

Power Spanner (and access to spare), Disc Saw (with spare discs), Rail Drill, Impact Wrench, Hack, Hammers, Sledge, Bar, Jacks, Secondary Support, Shovel, Hacksaw, Auger, Bogie, Track Gauge, Flame Cutting Equipment, Sleeper Tongs

MATERIALS

New Crossing (including all necessary components), Fishbolts, Fittings, Rail Pads, Washers, Replacement Plain/Insulated Fishplates, Fuel for Power Tools

SAFETY ARRANGEMENTS

Personal Protective Equipment (PPE) Required

Safety Footwear, Hi-Visibility Clothing, Suitable Gloves

Additional PPE Requirements

Disc Saw Operators – flame-retardant overalls, spats, dust mask, goggles, ear defenders, suitable gloves

Flame Cutting Operators – flame-retardant overalls, spats, spark-resistant gauntlets, flame cutting goggles, ear defenders

Power Spanner Operators – ear defenders

Rail Drill Operators – goggles, ear defenders

(These PPE requirements apply to all staff within 3 m of operators)

Minimum Warning Time (secs)

Not applicable

Protection Arrangements

TIII or local possession arrangements for working in yards

Can traffic run on an adjacent track 6 ft away?

Not applicable

RELATED WORK

(which may be carried out in conjunction with this work instruction but could require different protection arrangements)

Fettling of points and crossings. Resleepering of points and crossings. Packing of points and crossings.

GENERAL INFORMATION

All flame cutting operators MUST have attended the Cutting/Burning Course.

All disc saw operators, power spanner operators and rail drill operators MUST have attended the Small Plant and Equipment (SPE) Course.

DO'S AND DON'TS

Do's

- Do carry out a joint inspection beforehand with Signal & Telecoms to ensure all requirements are fully understood.
- Do determine what pre-drilling of the crossing can be carried out prior to its installation.
- Do determine by site inspection beforehand if re-gauging is required, and plan the work accordingly.
- Do ensure that all related/replacement components (Per Way and Signal & Telecoms) are available.
- Do ensure that others affected by the work planned (e.g. Signal & Telecoms and Operations Dept) are aware of what work is planned, and how it affects them.
- Do make sure that the replacement crossing is correct for the job (check with your supervisor) and is available at or near the worksite.
- Do consider using a road/rail excavator to assist in transporting/handling crossing components.
- Do check that the TIII (or local possession arrangements if working in yards) is suitable for the full extent of the work planned.
- Do carry out as much preparatory work as possible to save possession time.

4.1 CHANGING OLDER TYPE COMMON CROSSINGS

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WORK METHOD

1. Identify the person in charge for the work group.
2. Arrange protection.
3. Signal & Telecoms disconnect and remove fittings as required.
4. Lift or bar out the existing crossing.
5. Offer up new crossing, mark for cutting and fish-hole drilling.
6. Cut and drill as necessary using templates for fish-hole spacing.
7. Check and replace any defective material as required.
8. Lift or bar in new crossing.
9. Replace all fastenings and fishplates.
10. Signal & Telecoms reconnect all fittings and test track circuits etc. as necessary.
11. Tidy and clear the site.

FUTURE FOLLOW-UP WORK

Revisit site and ensure that all fittings are tight. Observe under traffic if possible.

RELATED WORK INSTRUCTIONS

9.1 Track Jacks
9.3 Power Spanners
9.7 Rail Saws
9.8 Rail Drills

INFRASTRUCTURE SAFETY STATEMENT REFERENCES

Refer to Infrastructure Safety Statement

Iarnród Éireann

4.2 CHANGING TURNOUT SWITCHES

EQUIPMENT

Bars, Hammers, Shovels, Jacks,
Pan-Pullers, Rail Tongs, Rail Drill,
Disc Saw (with spare discs),
Crosslevel/Track Gauge,
Rail Press (Jim Crow),
Power Spanner (and access to spare)

MATERIALS

Switches (pre-drilled if possible),
Stock Rail (if required),
Stretchers and Fittings, Stud Bolts,
Fishbolts, Fittings, Rail Pads, Washers,
Replacement Plain/Insulated Fishplates,
Slide Chair Lubricant, Wood Sleeper Plugs,
Fuel for Power Tools

SAFETY ARRANGEMENTS

Personal Protective Equipment (PPE) Required

Safety Footwear, Hi-Visibility Clothing, Suitable Gloves

Additional PPE Requirements

Disc Saw Operators – flame-retardant overalls, spats, dust mask, goggles, ear defenders, suitable gloves

Power Spanner Operators – ear defenders

Rail Drill Operators – goggles, ear defenders

(These PPE requirements apply to all staff within 3 m of operators)

Minimum Warning Time (secs)

Not applicable

Protection Arrangements

TII or TIII possession

Can traffic run on an adjacent track 6 ft away?

Yes, with lookout protection

RELATED WORK

(which may be carried out in conjunction with this work instruction but could require different protection arrangements)

Slide chair lubrication. Fettling of points and crossings. Resleepering of points and crossings. Packing of points and crossings. Maintenance of associated Signal & Telecoms equipment.

GENERAL INFORMATION

All disc saw operators, power spanner operators and rail drill operators MUST have attended the Small Plant and Equipment (SPE) Course.

Note that the track circuit and detection of the adjacent track will be affected when changing switches in a crossover.

DO'S AND DON'TS

Do's

- Do carry out a joint inspection with Signal & Telecoms beforehand to ensure all requirements are fully understood. Determine what pre-drilling of the switches can be carried out prior to installation.
- Do observe that the points opening is correct (Travel or Throw).
- Do determine by site inspection beforehand if re-gauging is required, and plan work accordingly.
- Do ensure availability of components and equipment (Per Way and Signal & Telecoms).
- Do ensure that others affected by the work planned (e.g. Signal & Telecoms and Traffic Dept) are aware of what work is planned, and how it affects them.
- Do make sure that the replacement switches are correct for the job (check with your supervisor) and are available at or near the worksite.
- Do consider using a road/rail atlas to assist in transporting/handling switches and stock rails.
- Do check that the TII or TIII possession planned (or local arrangements if working in yards) is suitable for the full extent of the work planned.
- Do carry out as much preparatory work as possible to save possession time.
- Do carry out Work Instruction 4.3 in conjunction with this work.

4.2 CHANGING TURNOUT SWITCHES

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WORK METHOD

1. Identify the person in charge for the work group.
2. Arrange protection.
3. Signal & Telecoms disconnect and remove fittings as required.
4. Reduce/remove rail fittings, fastenings and fishplates to release switch blade/stock rail as appropriate.
5. Lift or bar out the existing switch blade/stock rail.
6. Carry out any replacement/repair of defective components.
7. Measure and cut in new switch blade/stock rail – double-check measurement before cutting.
8. Lift or bar in new switch and stock rail. If these are separate components, the new stock rail must be barred in before the new switch.
9. Check gauge and squareness of switch-blade ends in conjunction with Signal & Telecoms, and fasten down.
10. Signal & Telecoms check switch for snugness of fit, and Per Way then adjust and lubricate as necessary – this may involve using the rail press. *Note:* where hand-operated points are involved, only Per Way check gauge, switch-blade squareness, snugness of fit, etc.
11. Signal & Telecoms reconnect all fittings and test track circuits etc.
12. Signal & Telecoms then request signalmen to test points 3 times for correct operation.
13. Tidy and clear the site.
14. Only hand back possession and leave the site when both Signal & Telecoms and signalmen are satisfied that the points are operating correctly.

FUTURE FOLLOW-UP WORK

Revisit site and ensure that all fittings are tight. Observe under traffic if possible.

Signal & Telecoms also revisit the site and check point operation.

Thermit weld joints.

RELATED WORK INSTRUCTIONS

4.3 Slide Chair Lubrication
9.1 Track Jacks
9.3 Power Spanner
9.7 Rail Saws
9.8 Rail Drills

INFRASTRUCTURE SAFETY STATEMENT REFERENCES

Refer to Infrastructure Safety Statement

Iarnród Éireann

4.3 SLIDE CHAIR LUBRICATION

EQUIPMENT

Brush (for applying new lubricant),

Spatula (for cleaning off dirt and old grease),

Wooden Scotch (for securing switch blades in open position)

MATERIALS

Approved Lubricant, Barrier Cream

SAFETY ARRANGEMENTS

Personal Protective Equipment (PPE) Required

Safety Footwear, Hi-Visibility Clothing, Suitable Gloves

Additional PPE Requirements

All Staff - barrier cream available (if required)

Nominated Grease Applicator - oil-resistant gloves

Minimum Warning Time (secs)

15 secs (see Table 1 in Appendix A)

Protection Arrangements

Lookout protection

Can traffic run on an adjacent track 6 ft away?

Yes, with lookout protection

RELATED WORK

(which may be carried out in conjunction with this work instruction but could require different protection arrangements)

Fettling of points and crossings.

GENERAL INFORMATION

Not applicable

DO'S AND DON'TS

Do's

- Observe point movement before beginning lubrication to see if any blade shudder is taking place and advise signalling maintenance staff if excessive shudder is occurring.
- Communicate with the signalman to seek permission to scotch the points. This is to prevent inadvertent point movement trapping Per Way staff and/or equipment.
- Place the scotch between the open switch and the stock rail so that movement cannot occur.
- Do ensure that ballast is kept at least 1 inch (25 mm) below the sleeper top to avoid ballast contaminating the slide chair surface.

Don'ts

- Don't use excessive lubricant that will spread and contaminate the ballast etc. adjacent to the slide chairs.
- Don't lubricate the new roller-type slide chairs - they do not require any lubrication.

4.3 SLIDE CHAIR LUBRICATION

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WORK METHOD

1. Identify the person in charge for the work group.
2. Arrange protection.
3. Talk to the signalman, identifying the point number, and obtain permission to insert the scotch between the open switch and stock rail.
4. Insert the scotch between the open switch and stock rail.
5. On the open switch rail, using the spatula, clean off all dirt, debris and contaminated grease etc. from all slide chair surfaces and also from all areas where the switch rail and stock rail come into contact.
6. Note any broken or cracked slide chairs or loose stock-rail bolts, stud-rail bolts etc. that are revealed during the cleaning process. Repair if time permits – otherwise, report these.
7. Apply the approved lubricant sparingly over the whole slide chair table on the open switch side.
8. Go to the closed switch and clean off dust, debris, contaminated grease etc. from the whole of the slide chair table.
9. Apply the approved lubricant sparingly over the whole slide chair table on the closed switch side.
10. Remove the scotch, advise the signalman and request that points be reversed.
11. Obtain permission from the signalman to insert the scotch between the open switch and stock rail.
12. Repeat steps 4 to 9.
13. Remove the scotch and advise the signalman that the scotch is removed and work complete.
14. Clear and tidy the site.

FUTURE FOLLOW-UP WORK

Repeat slide chair lubrication as necessary, depending on frequency of traffic/point movements and weather conditions.

RELATED WORK INSTRUCTIONS

4.2 Changing Turnout Switches

INFRASTRUCTURE SAFETY STATEMENT REFERENCES

Refer to Infrastructure Safety Statement

Iarnród Éireann

4.4 REPLACING BROKEN FISHPLATES AND BOLTS IN POINTS AND CROSSINGS

EQUIPMENT

2 Hand Spanners, Hammer, 1 Jack,
2 Shovels, 2 Hacks, Wire Brush,
1 Angle Grinder/File,
Hydraulic Joint Adjuster

MATERIALS

New Fishplates, New Fishbolts,
Washers, Shims, Grease, Barrier Cream,
Plastic Insulators (T-Pieces) and Inserts – only required if joint is insulated,
Fuel for Power Tools

SAFETY ARRANGEMENTS

Personal Protective Equipment (PPE) Required

Safety Footwear, Hi-Visibility Clothing, Suitable Gloves

Additional PPE Requirements

All Staff – barrier cream available (if required)

Angle Grinder Operators – flame-retardant overalls, spats, dust mask, goggles, ear defenders, suitable gloves

(These PPE requirements apply to all staff within 3 m of operators)

Nominated Grease Applicator – oil-resistant gloves

Minimum Warning Time (secs)

Not applicable

Protection Arrangements

TII or TIII possession

Can traffic run on an adjacent track 6 ft away?

Yes, with lookout protection

RELATED WORK

(which may be carried out in conjunction with this work instruction but could require different protection arrangements)

Fettling of points and crossings.

GENERAL INFORMATION

All angle grinder operators MUST have attended the Angle Grinder Course.

Establish the reason for the broken fishplate or bolt (e.g. dipped joints, poor packing, crippled rail ends etc.) and take appropriate action. Otherwise, the breakage will probably recur.

DO'S AND DON'TS

Do's

- Do get the correct equipment and material on site before starting work.
- Do pack the joint if possible before replacing broken components.
- Do replace worn bolts.
- Do shim if required (not applicable to an insulated joint).
- Do use matching pairs of fishplates.
- Do check rail ends and bolt holes for cracks – and take appropriate action.
- Do check track-circuit and traction bonds are satisfactory and advise Signal & Telecoms staff if they require attention.
- Do complete a broken and/or fractured fishplate report form if applicable.

Don'ts

- Don't dislodge or break off track-circuit bonds by clumsy working.
- Don't grease the outside surfaces of fishplates. Otherwise, defects might be obscured by the grease.
- Don't leave grease on the head of the rail.

4.4 REPLACING BROKEN FISHPLATES AND BOLTS IN POINTS AND CROSSINGS

Iarnród Éireann

WORK METHOD

1. Identify the person in charge for the work group.
2. Get material and equipment ready on site.
3. Arrange protection.
4. Dismantle existing joint.
5. Clean off fishing surfaces and rail ends. Inspect for cracks, incorrect drilling of holes etc.
6. File or grind off any lipping on the rail head.
7. Put grease on fishing surfaces (not applicable to an insulated joint).
8. Check the fit of replacement fishplates, bolts, insulators etc.
9. Offer up 1 new fishplate with bolts (complete with insulation and T-Piece if applicable), and fit against the rail. Then fit the second fishplate, making sure that no track-circuit bonds are trapped in the process.
10. Starting with the middle bolts, tighten up the fishbolts and then re-check all fishbolts for tightness.
11. If bolts won't fit, use the hydraulic joint adjuster as necessary to move the rails slightly apart or closer together.
12. For non-insulated joints, check if shims are required and fit as necessary.
13. Remove redundant materials etc. and clear the site.

Notes

- Insulated joints should be tightened with a torque spanner to the correct torque for that particular type of insulated joint.
- With insulated joints in flat-bottom-type points and crossings, use only high tensile fishbolts (stamped with a V on the bolt head).
- Note especially that sleeper spacing and/or position of steel rail fastenings/keys may need adjustment to prevent them touching the steel (i.e. un-insulated) part of an insulated joint and causing the track circuit to drop.

FUTURE FOLLOW-UP WORK

The patrol ganger keeps the joint under observation for bolts working loose etc.

RELATED WORK INSTRUCTIONS

2.1 Lubrication of Rail Joints
2.2 Repair and Shimming of Rail Joints
2.3 Packing of Rail Joints
2.4 Repair and Changing of Insulated Joints
4.1 Changing Older Type Common Crossings
4.2 Changing Turnout Switches
4.5 Manual Packing of Older Type Common Crossings
9.1 Track Jacks

INFRASTRUCTURE SAFETY STATEMENT REFERENCES

Refer to Infrastructure Safety Statement

Iarnród Éireann

4.5 MANUAL PACKING OF OLDER TYPE COMMON CROSSINGS

EQUIPMENT

2 or more Hydraulic Jacks, Shovels, Hacks,

Crosslevel/Track Gauge,

Pan Pullers/Spanners (for tightening fasteners),

Angle Grinder (for removing rusted fastenings),

Hand-Held Power Tamping Tool or Beater

MATERIALS

Suitable (Hard) Ballast or Chippings (preferably ¾ inch nominal size),

Fuel for Power Tools,

Spare: Pads, Fastenings, Screws, Ferrules,

Fangbolts, Crossing Bolts and Washers,

Bull-head Keys and Joint Shims

SAFETY ARRANGEMENTS

Personal Protective Equipment (PPE) Required

Safety Footwear, Hi-Visibility Clothing, Suitable Gloves

Additional PPE Requirements

Angle Grinder Operators – flame-retardant overalls, spats, dust mask, goggles, ear defenders, suitable gloves

Beater Operators – goggles

Power Tamping Tool Operators – goggles, ear defenders

(These PPE requirements apply to all staff within 3 m of operators)

Minimum Warning Time (secs)

Not applicable

Protection Arrangements

TII or TIII possession

Can traffic run on an adjacent track 6 ft away?

Only if packing a turnout when lookout protection is required.

Crossovers need special consideration.

RELATED WORK

(which may be carried out in conjunction with this work instruction but could require different protection arrangements)

Fettling of all fastenings – renew, tighten, re-pad, re-clip as necessary.

Shimming the nose of bull-head common crossings.

GENERAL INFORMATION

All angle grinder operators MUST have attended the Angle Grinder Course.

Observe the behaviour of the crossing under traffic to judge the extent of the work required.

Replace broken chairs or baseplates. For bull-head crossings, use the correct size shim, and insert or pack and secure it to the crossing timber by bending the shim over and nailing or stapling it down to the timber.

DO'S AND DON'TS

Do's

- Do use hydraulic jacks (rather than mechanical jacks) for lifting. Mechanical jacks are more difficult to control accurately during lifting operations. Hydraulic jacks are essential for lifting heavier common crossings/rail sections.
- Do lift in the direction of traffic, and lift the worse rail first (but preferably lift both rails).
- Do tighten/fettle all fastenings etc. prior to lifting and packing operations.
- Do use 4 jacks (rather than 2) if lifting more than 5 or 6 long timbers, and lift together.
- Do look out for cables and rods etc. that may be affected by the work.
- Do check that the nose of the crossing pack is in place and secure.

Don'ts

- Don't lift underneath the insulated joint itself. Otherwise, you may cause the track circuit to drop.

4.5 MANUAL PACKING OF OLDER TYPE COMMON CROSSINGS

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WORK METHOD

1. Identify the person in charge for the work group.
2. Arrange protection.
3. Fettle the crossing area. This may require a separate shift, depending upon layout conditions.
4. Dig out all the boxes for packing to the sleeper bottom. If chipping packing, only dig out alternate boxes.
5. Put 2 jacks in place, facing each other ahead of the crossing nose, and lift over level to assist packing.
6. Pack the timbers using either of the following methods:

Chipping Packing		Cobra/Beater Packing	
6a	Spread chippings evenly beneath the timber on the ballast bed – use a long-handled trowel or shovel.	6i	NB Only lift slightly over level with this method.
6b	Release both jacks at the same time to help chipping compaction.	6ii	Pack each sleeper from both sides (diagonally opposite each other) unless using 4 Cobras.
6c	Check crosslevel throughout and box in ballast.	6iii	If beater packing, pack each sleeper working diagonally opposite each other to make physical room for each person.
		6iv	Pack until firm (stone on point of breaking up).
		6v	Follow chipping procedures 6a–6c.

7. Check all flangeways are clear of ballast, chippings etc.
8. Tidy the site and hand back possession.
9. Watch crossing behaviour under traffic and arrange to pack again if necessary.

FUTURE FOLLOW-UP WORK

Observe crossing under traffic and arrange to pack again if necessary.
The patrol ganger monitors crossing.

RELATED WORK INSTRUCTIONS

4.1 Changing Older Type Common Crossings
4.6 Conversion of Back-Hole Fishjoints to 4-Hole Joints
9.1 Track Jacks
9.4 Hand-Held Power Tamping Tools

INFRASTRUCTURE SAFETY STATEMENT REFERENCES

Refer to Infrastructure Safety Statement

Iarnród Éireann

4.6 CONVERSION OF BACK-HOLE FISHJOINTS TO 4-HOLE JOINTS

EQUIPMENT

Fishbolt Spanners, Angle Grinder, Hydraulic Jack and Handle, Rail Drill, Generator (110 V), Cutting Tools, Template, Fang Wrench or Pan Puller, Impact Wrench, Steel Brush

MATERIALS

2 New Fishbolts, Spare Nuts and Washers, Fishplate Grease, Spare Fishplates, Cooling Fluid, Fuel for Power Tools

SAFETY ARRANGEMENTS

Personal Protective Equipment (PPE) Required

Safety Footwear, Hi-Visibility Clothing, Suitable Gloves

Additional PPE Requirements

Angle Grinder Operators – flame-retardant overalls, spats, dust mask, goggles, ear defenders, suitable gloves

Rail Drill Operators – goggles, ear defenders

(These PPE requirements apply to all staff within 3 m of operators)

Minimum Warning Time (secs)

Not applicable

Protection Arrangements

TII or TIII possession

Can traffic run on an adjacent track 6 ft away?

Yes, with lookout protection

RELATED WORK

(which may be carried out in conjunction with this work instruction but could require different protection arrangements)

Fettling of all fastenings – renew, tighten, re-pad, re-clip as necessary.

GENERAL INFORMATION

All angle grinder operators MUST have attended the Angle Grinder Course.

All rail drill operators MUST have attended the Small Plant and Equipment (SPE) Course.

Only 110 V generators may be used.

Watch the behaviour of the crossing under traffic to judge the extent of the work required.

DO'S AND DON'TS

Do's

- Do replace any bent or damaged fishbolts.
- Do replace any broken baseplates.
- Do check that you have the correct template.
- Do drill from the non-branded side of the rail if possible.

Don'ts

- Don't break any signalling or traction bonds.

4.6 CONVERSION OF BACK-HOLE FISHJOINTS TO 4-HOLE JOINTS

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WORK METHOD

1. Identify the person in charge for the work group.
2. Arrange protection.
3. Remove existing fishplates avoiding damage to bonding.
4. Check condition of fishplates and rail ends for cracks or other defects.
5. Jack up the low end (if necessary).
6. Apply templates to rail head and drill – ensure you have the correct cutting tools.
7. Drill hole – drill from the non-branded side, if possible.
8. Re-set the drill for the second hole.
9. Remove the drill and clean the hole of swarf.
10. Apply grease to fishing surfaces of the fishplate.
11. Reassemble the joints as for Work Instruction 4.4 and tighten joints.
12. Pack joints and guard.
13. Remove the jack and tidy the site.

FUTURE FOLLOW-UP WORK

The patrol ganger keeps joints under observation for bolts working loose etc.

RELATED WORK INSTRUCTIONS

2.1 Lubrication of Rail Joints
2.3 Packing of Rail Joints
4.4 Replacing Broken Fishplates and Bolts in Points and Crossings
9.1 Jack Tracks
9.5 Generators for Lights, Saws, Drills

INFRASTRUCTURE SAFETY STATEMENT REFERENCES

Refer to Infrastructure Safety Statement

Iarnród Éireann

5.1 CLEANING AND MAINTAINING PERMANENT WAY DRAINAGE

EQUIPMENT

Shovels, Slash Hooks,

Cleaning Rods or Scraper, and/or Pressure Jetting Equipment (used by contractors only)

MATERIALS

Not applicable

SAFETY ARRANGEMENTS

Personal Protective Equipment (PPE) Required

Safety Footwear, Hi-Visibility Clothing, Overalls, Waterproof Gloves, Goggles

Cleaning materials for washing hands etc. must be available

Additional PPE Requirements

All Staff – as required, waterproof trousers and jacket, and waterproof footwear (sufficient to prevent overtopping)

Minimum Warning Time (secs)

Not applicable

Protection Arrangements

TII or TIII possession or as appropriate to location

Can traffic run on an adjacent track 6 ft away?

Yes – when working on the cess side, with lookout protection

No – when working on the six-foot side

RELATED WORK

Not applicable

GENERAL INFORMATION

Confined Spaces

THIS WORK INSTRUCTION DOES NOT COVER WORKING IN CONFINED SPACES.

A confined space means any place which, by its enclosed nature, creates conditions giving rise to the likelihood of accident, harm or injury requiring emergency action due to:

- The presence (or reasonably foreseeable presence) of flammable atmospheres; harmful gas or vapour; free-flowing solid(s) or an increasing level of liquid; excess of oxygen; excessively high temperature
- Lack (or reasonably foreseeable lack) of oxygen

For reference, any manhole where the head and shoulders of the average person is below the level of the manhole top when standing in the hole should be regarded as a confined space. The minimum size of gang is two persons when working in shallow manholes (i.e. where the head and shoulders of the average person remain above ground level when standing in the hole).

Please refer to the Infrastructure Safety Statement for requirements regarding working in confined spaces.

Drainage Hazards

The most likely hazards found in drainage systems are flammable substances (e.g. oil and petrol); oxygen enrichment or deficiency; gases or vapours; water or contaminated water; excessive heat (probably where hot working or steam cleaning is undertaken nearby).

Be aware of Leptospiral Jaundice (Weil's Disease), an infectious disease carried by rats and other vermin and excreted in their urine. The infection is treatable and results in flu-like symptoms. Anyone suffering these symptoms should consult a doctor. As the infection enters through breaks in the skin, all exposed cuts and abrasions should be covered with a waterproof plaster as a precaution.

DO'S AND DON'TS

Do's

- Do employ normal hygiene rules, e.g. all staff should wash thoroughly before entering any canteen, mess room or office accommodation and before eating, drinking or smoking.
- Do remove and wash thoroughly, as soon as possible, all clothing that has been in contact with sewage or contaminated water.
- Do report to the person in charge any unusual material found in catch pits or drains when cleaning.

5.1 CLEANING AND MAINTAINING PERMANENT WAY DRAINAGE

Iarnród Éireann

WORK METHOD

Pipes or Troughs

1. Identify the person in charge for the work group.
2. Arrange protection.
3. If applicable, remove manhole and/or catch-pit covers at both ends of the pipe or trough to be cleaned.
4. Visually check the manhole and/or catch-pit chambers to identify any hazards and take care when entering.
5. Clean the pipe by passing through the rod or scraper or by having the pressure jet operator remove silt and debris. Consult the person in charge if the pipe does not clear. It may be fractured or broken.
6. If the trough is lidded, remove lids to gain access. Clean the trough and replace any defective lids.
7. Dispose of silt and debris removed from the pipe or trough clear of the track and ballast. Otherwise, the material may settle out again and create a problem downstream.

Catch Pits and Manholes

1. Identify the person in charge for the work group.
2. Arrange protection.
3. Before entry, check that access equipment (step irons, ladders, walkways and handrails) is free from rust, corrosion, damage, burrs, or rough or sharp edges likely to cause injury or accident, and that fixings are secured firmly in place.
4. Before entry, check that the area is safe to enter, i.e. that there is no risk of collapse. Specifically check that any chambers, manholes, pits and holding tanks are free from leaks, deformation, surface damage, spalling, excess staining or signs of surcharge.
5. Replace any defective material or fittings.
6. Dispose of litter, silt and debris that have collected in the manhole or catch pit in a proper manner.

Ditches

1. Identify the person in charge for the work group.
2. Arrange protection.
3. Clear vegetation other than trees and short grass growing on the banks.
4. Clear any litter, debris or waste and leave in a free-flowing condition.

FUTURE FOLLOW-UP WORK

Not applicable

RELATED WORK INSTRUCTIONS

10.2 Noise Abatement in Urban Areas

INFRASTRUCTURE SAFETY STATEMENT REFERENCES

Refer to Infrastructure Safety Statement

Iarnród Éireann

5.2 MUCKY AND WET SPOT TREATMENT

EQUIPMENT

Shovels, Hacks, Jacks, Wheelbarrow,

Excavator (if possession available),

Hand-Held Power Tamping Tool (with chisel and tamping tool attachment)

MATERIALS

Clean Ballast, Fuel for Power Tools

SAFETY ARRANGEMENTS

Personal Protective Equipment (PPE) Required

Safety Footwear, Hi-Visibility Clothing, Suitable Gloves

Additional PPE Requirements

Power Tamping Tool Operators – goggles, ear defenders

(These PPE requirements apply to all staff within 3 m of operators)

Minimum Warning Time (secs)

25 secs – add 5 secs for every advance lookout (see Table 1 in Appendix A)

Protection Arrangements

Where warning time is not achievable, a TII or TIII possession is required.

Can traffic run on an adjacent track 6 ft away?

Yes, with lookout protection

RELATED WORK

(which may be carried out in conjunction with this work instruction but could require different protection arrangements)

Changing sleepers, fangbolts, fishplates, rails etc.

Shimming, cross-boring and drainage works.

GENERAL INFORMATION

If a possession is available, an excavator may be used instead of the manual excavation methods described in this work instruction. All hired-in excavator operators MUST have a valid Personal Track Safety Certificate.

Check gauge and cant through site up to and including 3 to 4 sleepers either side.

If applicable, check the condition of any joints within the site (see Work Instructions 2.2 and 2.3).

If applicable, check the condition of insulated glued joints (see Work Instruction 2.5) in or near the site and assess whether concrete bearers are required – consult the person in charge.

Check track in the vicinity for other faults that could be attended to at the same time.

DO'S AND DON'TS

Do's

- Do always use clean ballast.
- Do use centre-shoring to drain away excess water if required.

Don'ts

- Don't undermine more than 2 sleepers at the same time.
- Don't undertake mucky spot work in hot weather without consulting the person in charge.
- Don't do more than 6 boxes without consulting the person in charge.

5.2 MUCKY AND WET SPOT TREATMENT

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WORK METHOD

Individual Sleepers

1. Identify the person in charge (PIC) for the work group and arrange protection.
2. Shovel off reusable loose stone and store nearby.
3. Marginally lift track with the jack to break the bed (wind the jack).
4. Use the chisel attachment with the power tamping tool or use the hack to loosen the ballast as required. Dig out 100–150 mm beneath sleeper bottom leaving a crossfall to the cess.
5. Dispose of mucky ballast into the cess or clear from the site as directed by PIC.
6. Put clean stockpiled ballast into box and pack in 50 mm layers using the power tamping tool up to approximately 50 mm above the sleeper bottom.
7. Lift track to correct level with jacks and check crosslevel.
8. Box in sleepers with ballast and restore ballast profile. Clean and tidy the site.

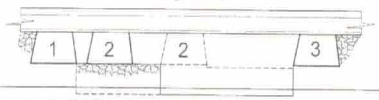
Series of Slurried Sleepers (see Figures A–C)

1. Proceed as for individual sleepers and include the steps below.
2. Excavate all ballast from between sleepers 1 & 2 (Figure A). Open out the crib between sleepers 2 & 3 to just below bottom of sleeper level for the length of the sleepers and produce crossfall to cess. Do this work only when rail temperature is below 32 °C.
3. Backfill the crib with clean ballast between sleepers 1 & 2 to bottom of sleeper level. Pack the ballast in 50-75 mm layers to 375 mm either side of each rail.
4. Unclip sleeper 2 (Figure B). Remove insulators & pads and move sleeper onto clean ballast provided in crib between sleepers 1 & 2. Fit pads, insulators & clips. Pack sleeper.
5. Excavate the remaining ballast in the crib between sleepers 2 & 3 and the ballast which originally supported sleeper 2 (Figure C).
6. Repeat step 3 for sleepers 2 & 3 and return sleeper 2 to its correct position. Pack the sleeper.
7. Repeat procedure for remaining slurried sleepers.
8. Excavate ballast at sleeper ends to the same depth as crib excavation. Backfill with clean ballast.

Figure A

Figure B

Figure C



FUTURE FOLLOW-UP WORK

The patrol ganger, ganger or inspector monitors site conditions.

RELATED WORK INSTRUCTIONS

2.2	Repair and Shimming of Rail Joints
2.3	Packing of Rail Joints
2.5	Maintenance and Changing of Glued Joints
5.1	Cleaning and Maintaining Permanent Way Drainage
8.1	Excavators, Dumpers, Mini-Diggers
9.1	Track Jacks
9.4	Hand-Held Power Tamping Tools

INFRASTRUCTURE SAFETY STATEMENT REFERENCES

Refer to Infrastructure Safety Statement

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6.1 CORRECTING TOP AND TWIST FAULTS

EQUIPMENT

Track Gauge, Jack, Secondary Support, Hacks, Shovels, Claw Bar, Power Spanner, Hand-Held Power Tamping Tool or Stone Blower, Beater, Void Meters (if required), Sighting Boards or Track Levelling Instrument (if required)

MATERIALS

Ballast, Chippings if required, Fuel for Power Tools

SAFETY ARRANGEMENTS

Personal Protective Equipment (PPE) Required

Safety Footwear, Hi-Visibility Clothing, Suitable Gloves

Additional PPE Requirements

Beater Operators – goggles

Power Spanner Operators – ear defenders

Power Tamping Tool Operators – goggles, ear defenders

(These PPE requirements apply to all staff within 3 m of operators)

Minimum Warning Time (secs)

Not applicable

Protection Arrangements

TII or TIII possession.

For minor corrections over short distances (maintenance packing), lookout protection may be acceptable for shovel or beater packing.

Can traffic run on an adjacent track 6 ft away?

Yes, with lookout protection

RELATED WORK

(which may be carried out in conjunction with this work instruction but could require different protection arrangements)

Repair and shimming of joints. Packing of joints. Mucky spot treatment.

GENERAL INFORMATION

Packing must not be done where the rail temperature exceeds 32 °C. When packing on curves, pay particular attention to maintaining alignment and crosslevel (cant).

All power spanner operators MUST have attended the Small Plant Equipment (SPE) Course.

Likely Problem Locations

- At dipped joints, points and crossings and breather switches
- Where there are voids between chairs or baseplates and sleepers
- Where there is movement under train load, such as where voids exist under sleepers, mucky spots and/or chairs or baseplates bedded into sleepers
- Where a change of track support occurs, e.g. ballasted to non-ballasted track

Top fault: a difference in level of the top of the rail over a short distance.

Twist fault: a track condition where there is a rapid change in crosslevel (cant) over a short distance. This tends to cause one or more wheels of a vehicle to become lightly loaded. When sideways forces accompany this, such as on curves or where there is poor alignment, it may cause a wheel to mount the rail resulting in a derailment.

DO'S AND DON'TS

Do's

- Do take care on curves to maintain the crosslevel (cant).
- Do use a secondary support to the jack (e.g. timber block, timber offcuts).
- Do take care to pack evenly as uneven settlement will result in a new twist fault occurring.
- Do carry out repairs in the direction in which traffic normally runs (applicable to double track railway).

Don'ts

- Don't over-lift the track when packing. This could introduce a new twist fault.
- Don't undertake twist fault correction unless the person in charge has been trained in this work.

6.1 CORRECTING TOP AND TWIST FAULTS

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WORK METHOD

Correcting Top Faults

1. Identify the person in charge for the work group.
2. Arrange protection.
3. Assess any voids at each sleeper position, either by using a void meter or visually as a train passes over the track.

   Note: Maximum difference in top should not exceed:
   - 20 mm for lines with speed under 70 mph
   - 12 mm for lines with speed over 70 mph
4. Dig out any dirty ballast and replace with clean.
5. Jack the track to level top and insert secondary support (e.g. timber blocks or sleeper offcuts).
6. Pack ballast firmly under sleepers using the shovel beater, hand-held stone blower or power tamping tool.
7. Remove secondary support and release the jack in a controlled manner.
8. Box in sleepers.
9. Check the site with track gauge to ensure twist fault has been removed/reduced.
10. Clear and tidy the site.

Correcting Twist Faults

1. Identify the person in charge for the work group.
2. Arrange protection.
3. Using the track gauge, take crosslevel readings at 1 m intervals for a length of 10 m either side of the fault.

   Note: Maximum crosslevel (cant) change should not exceed:
   - 5 mm per 2 mm of track or
   - 2 mm per sleeper centre spacing
4. Establish high point and level one leg to this using the sighting board or track levelling instrument. With the levelled leg as reference (using the track gauge instrument), jack the other rail to the required level and insert secondary support. In the case of curved track, the low leg must be levelled first.
5. Assess any voids at each sleeper position under both rails, either by using a void meter or visually as a train passes over the track.
6. Dig out any dirty ballast and replace with clean.
7. Pack ballast firmly under sleepers using the shovel beater, hand-held stone blower or power tamping tool.
8. Remove secondary support and release the jack in a controlled manner.
9. Box in sleepers.
10. Check the site with track gauge to ensure twist fault has been removed/reduced.
11. Clear and tidy the site.

FUTURE FOLLOW-UP WORK

The patrol ganger, ganger or inspector monitors site conditions.

RELATED WORK INSTRUCTIONS

2.2 Repair and Shimming of Rail Joints
2.3 Packing of Rail Joints
4.5 Manual Packing of Older Type Common Crossings
5.2 Mucky and Wet Spot Treatment
9.1 Track Jacks
9.3 Power Spanners
9.4 Hand-Held Power Tamping Tools

INFRASTRUCTURE SAFETY STATEMENT REFERENCES

Refer to Infrastructure Safety Statement

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6.2 CORRECTING GAUGE FAULTS

EQUIPMENT

Track Gauge, Power Spanner,
Sleeper Boring Machine, Key Hammer,
Claw Bars, Shovel, Gauge Tie-Bar(s)

MATERIALS

Keys/Clips, Fuel for Power Tools,
Chairs/Baseplates, Fangbolts, Sleepers,
Screw Coils and Rail (as required)

SAFETY ARRANGEMENTS

Personal Protective Equipment (PPE) Required

Safety Footwear, Hi-Visibility Clothing, Suitable Gloves

Additional PPE Requirements

Power Spanner Operators – ear defenders

Sleeper Boring Machine Operator – goggles, ear defenders

(These PPE requirements apply to all staff within 3 m of operators)

Minimum Warning Time (secs)

Not applicable

Protection Arrangements

TII or TIII possession

Can traffic run on an adjacent track 6 ft away?

Yes, with lookout protection

RELATED WORK

(which may be carried out in conjunction with this work instruction but could require different protection arrangements)

Changing rails. Replacing fastenings. Replacing sleepers. Correcting geometry faults.

GENERAL INFORMATION

All power spanner operators and sleeper boring machine operators MUST have attended the Small Plant and Equipment (SPE) Course.

In plain track, wide gauge is most critical on curves where higher sideways forces, pushing the high rail outwards, could permit a train wheel to drop into the five foot (derailment).

At points and crossings, wide gauge is most critical at the toes of the points where it can cause incorrect operation and at the crossing nose where it could permit a train wheel to take the wrong path.

Wide gauge is caused by:

- Loose, broken or missing keys/clips, chairs/baseplates or fangbolts
- Missing or defective sleepers
- Bolt holes in sleepers elongated due to poor condition of timber
- Sideworn rail in curves
- Outer edge of the chairs or baseplates indenting the timbers causing the rail to back cant
- A combination of any or all of the above

DO'S AND DON'TS

Do's

- Do take care to maintain crosslevel.
- Do use an insulated track gauge instrument in track-circuited areas.
- Do use insulated gauge tie-bars in track-circuited areas.
- Do take care to pack evenly after sleeper replacement or re-fangbolting.
- Do ensure that there are no abrupt changes in gauge.

Don'ts

- Don't introduce a twist by over-lifting.

6.2 CORRECTING GAUGE FAULTS

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WORK METHOD

1. Identify the person in charge for the work group.
2. Arrange protection.
3. Using the track gauge instrument, check the gauge throughout the worksite to identify the exact location of the fault and, if possible, watch a train cross it. The fault may only be visible when under the load of a train.
4. Examine the track to identify leg(s) to be adjusted.
5. Check for missing or broken keys or clips and replace.
6. Check for broken or missing chairs or baseplates and replace.
7. Adjustment can be carried out by rehabilitation of existing fastenings or by drilling into new wood.
8. Using the track gauge instrument, re-check the gauge throughout the worksite to ensure the fault has been addressed.
9. Clear and tidy the site.

FUTURE FOLLOW-UP WORK

The patrol ganger, ganger or inspector monitors site conditions.

RELATED WORK INSTRUCTIONS

1.1 Changing Rails in CWR (Rerailing)
1.2 Changing Rails in Jointed Track
3.1 Replacing Fangbolt Fastenings on Timber Sleepers
3.2 Manual Replacement of Timber Sleepers
6.1 Correcting Top and Twist Faults
9.3 Power Spanners

INFRASTRUCTURE SAFETY STATEMENT REFERENCES

Refer to Infrastructure Safety Statement

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7.1 WOODEN FENCING

EQUIPMENT

Excavator (if required), Hammer,

Wire Cutter, Pliers, Wire Puller,

Timber Mallet, Bar, Slash Hook,

Tape (or other means of spacing out posts),

Chainsaw (if required) – only to be used by certificated operator

MATERIALS

Staples, Fence Posts, Wire

SAFETY ARRANGEMENTS

Personal Protective Equipment (PPE) Required

Safety Footwear, Hi-Visibility Clothing, Suitable Gloves, Goggles

Additional PPE Requirements

Chainsaw Operators – combination helmet (head protection and visor), chainsaw protective trousers with ballistic nylon, special protective gauntlets and boots

(These PPE requirements apply to all staff within 3 m of operators)

Minimum Warning Time (secs)

Not applicable

Protection Arrangements

If an excavator is used, a TIII possession is required where there is a risk of a machine fouling the line. Otherwise, lookout protection can be used.

Can traffic run on an adjacent track 6 ft away?

Yes, with lookout protection unless there is a risk of a machine fouling the line

RELATED WORK

(which may be carried out in conjunction with this work instruction but could require different protection arrangements)

Improvement of views by cutting back vegetation. This may include the use of slash hooks and chainsaws.

Minor repairs carried out by the patrol ganger.

GENERAL INFORMATION

All chainsaw operators MUST be certificated.

All hired-in excavator operators MUST have a valid Personal Track Safety Certificate.

Use plain wire and not barbed wire (or similar) if horses are to be fenced off.

The person in charge gives instructions regarding which type of wire to use.

The different types of wire available are:

- Plain
- Barbed
- Bull
- Sheep
- Chain-linked

The horizontal wires should be closer together at the bottom than at the top.

DO'S AND DON'TS

Do's

- Do staple the wire to the field side of the wooden fence post.

Don'ts

- Don't over-strain wire.
- Don't make temporary joints in strained wire.
- Don't allow gaps to remain between the ground and the bottom wire. If necessary, level the ground.

7.1 WOODEN FENCING

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WORK METHOD

1. Identify the person in charge for the work group.
2. Arrange protection (if applicable).
3. Clear the site.
4. Dig post holes with the bar.
5. Place posts depending on site conditions - 7 ft (2.1 m) maximum distance apart.
6. Use timber sleepers or tie into trees for straining.
7. Run the wire from top to bottom and staple as you proceed.
8. Do not over-drive the staples, but drive them in firmly enough to hold wire.
9. Do not leave the end of the wire loose or protruding.
10. Clear all equipment, materials and debris from the site.

FUTURE FOLLOW-UP WORK

Not applicable

RELATED WORK INSTRUCTIONS

8.1 Excavators, Dumpers, Mini-Diggers

INFRASTRUCTURE SAFETY STATEMENT REFERENCES

Refer to Infrastructure Safety Statement

Iarnród Éireann

7.2 CONCRETE FENCING

EQUIPMENT

Tape, Spray Paint, Excavator (if required), Cement Mixing Equipment, Spirit Level, String Line, Shovels, Rammer, Wire Cutter, Pliers, Wire Puller, Spanner, Slash Hook

MATERIALS

Tying Wire, Strainers, Wire, Standard Stakes, Cement, Gravel Water, Straining Post and End Post

SAFETY ARRANGEMENTS

Personal Protective Equipment (PPE) Required

Safety Footwear, Hi-Visibility Clothing, Suitable Gloves

Additional PPE Requirements

Cement Mixer Operators – dust mask, goggles, ear defenders

(These PPE requirements apply to all staff within 3 m of operators)

Minimum Warning Time (secs)

Not applicable

Protection Arrangements

If an excavator is used, a TIII possession is required where there is a risk of a machine fouling the line. Otherwise, lookout protection can be used.

Can traffic run on an adjacent track 6 ft away?

Yes, with lookout protection unless there is a risk of a machine fouling the line

RELATED WORK

(which may be carried out in conjunction with this work instruction but could require different protection arrangements)

Improvement of views by cutting back vegetation. This may include the use of slash hooks and chainsaws.

Minor repairs carried out by the patrol ganger.

GENERAL INFORMATION

All hired-in excavator operators MUST have a valid Personal Track Safety Certificate.

Use plain wire and not barbed wire (or similar) if horses are to be fenced off.

The person in charge gives instructions regarding which type of wire to use.

The different types of wire available are:

- Plain
- Barbed
- Bull
- Sheep
- Chain-linked

Depending on the size of the fencing job, ready-mix concrete may be used provided access is suitable.

DO'S AND DON'TS

Do's

- Do make sure the wire is on the field side of the straining posts and secured with tying wire.

Don'ts

- Don't over-strain wire.
- Don't make temporary joints in strained wire.
- Don't allow gaps to remain between the ground and the bottom wire. If necessary, level the ground.

7.2 CONCRETE FENCING

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WORK METHOD

1. Identify the person in charge for the work group.
2. Arrange protection (if applicable).
3. Clear the site.
4. Mark out locations for the straining post holes using spray paint, the string line and tape.
5. Excavate holes.
6. Erect straining posts.
7. Mix concrete (if ready-mix is not used).
8. Level the straining posts in holes with spirit level.
9. Pour concrete and use the rammer to compact the concrete around the base of each straining post.
10. Put in straining eyes.
11. Starting on the top level at one end, run the wire through the hole of the straining eye and back around the post to secure.
12. Run the wire onto the adjacent post securing in a similar manner, and so on. When the top level is complete, move down to the next level.
13. When all straining eyes have been completed, tie to secure and cut off any excess.
14. Clear all equipment, materials and any debris from the site.

FUTURE FOLLOW-UP WORK

Not applicable

RELATED WORK INSTRUCTIONS

8.1 Excavators, Dumpers, Mini-Diggers

INFRASTRUCTURE SAFETY STATEMENT REFERENCES

Refer to Infrastructure Safety Statement

Iarnród Éireann

7.3 REMOVING ANIMALS FROM THE LINE

EQUIPMENT

Slash Hook

MATERIALS

Refer to Work Instructions 7.1 and 7.2 for fencing if required

SAFETY ARRANGEMENTS

Personal Protective Equipment (PPE) Required

Safety Footwear, Hi-Visibility Clothing, Suitable Gloves

Additional PPE Requirements

All necessary equipment for protection of the line (e.g. flags, detonators)

Minimum Warning Time (secs)

Trains are cautioned or stopped as dictated by site conditions until the line is clear. (see Table 1 in Appendix A)

Protection Arrangements

The signalman arranges for trains to be stopped or operate under caution.

Can traffic run on an adjacent track 6 ft away?

Yes, under caution if adjacent line is not fouled

RELATED WORK

(which may be carried out in conjunction with this work instruction but could require different protection arrangements)

Fencing.

GENERAL INFORMATION

Ensure all animals are removed as instructed by the person in charge.

DO'S AND DON'TS

Do's

- Do be cautious of frightened animals and be patient.
- Do remove dead and/or injured animals from the line if possible.
- Do inform the signalman when the line is clear.

7.3 REMOVING ANIMALS FROM THE LINE

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WORK METHOD

1. Confirm protection/safety arrangements with the person in charge.
2. Locate the nearest suitable location for herding animals off the line.
3. Any animals found on the line should be herded off the line.
4. Locate the point of entry and make safe. Undertake emergency repairs as necessary.
5. Advise the person in charge if other animals are found injured or killed.
6. Advise the person in charge of the work required to make a permanent repair.
7. Inform the signalman when the line is clear.

FUTURE FOLLOW-UP WORK

The patrol ganger, ganger or inspector monitors site conditions.

RELATED WORK INSTRUCTIONS

7.1 Wooden Fencing
7.2 Concrete Fencing

INFRASTRUCTURE SAFETY STATEMENT REFERENCES

Refer to Infrastructure Safety Statement

Iarnród Éireann

8.1 EXCAVATORS, DUMPERS, MINI-DIGGERS

EQUIPMENT

Road/Rail Excavator, Tracked Excavator, Rubber Tyred Digger, Mini-Digger, Dumper (including Road/Rail Dumper)

MATERIALS

Fuel for non-hired plant (if applicable)

SAFETY ARRANGEMENTS

Personal Protective Equipment (PPE) Required

Safety Footwear, Hi-Visibility Clothing, Suitable Gloves

Additional PPE Requirements

All Staff – ear defenders and hard hat if movements are above chest height or site is designated "Hard Hat Required"

Minimum Warning Time (secs)

Not applicable

Protection Arrangements

TIII possession is required where there is a risk of the machine fouling the line.

Can traffic run on an adjacent track 6 ft away?

Yes, unless there is a risk of the machine fouling the line. Special arrangements for a safe system of work may apply.

RELATED WORK

(which may be carried out in conjunction with this work instruction but could require different protection arrangements)

As appropriate to work activity

GENERAL INFORMATION

If the machines are used as cranes (i.e. for lifting materials), Work Instruction 8.2 applies.

If the machines are used in a road/rail capacity, *I-PLM-5100 Requirements for Use of Road/Rail Machines* applies.

If any Signal & Telecoms (S&T) cables or other underground services could be present, work as per 9.0 Safe Digging Practice in *Code of Practice for Avoiding Danger from Underground Services, HSA 2005.*

All hired-in machine operators MUST have a valid Personal Track Safety Certificate.

Stay within view of the machine operator and don't travel on the machines.

Ensure all machines are stopped prior to train movement when loading/unloading materials.

DO'S AND DON'TS

Do's

- Do check prior site arrangements have been made to protect cables and other services – see Work Method for details.
- Do be careful when digging in any case – absence of records doesn't mean that ground is free of underground services.
- Do advise the local S&T supervisors immediately if you suspect damage may have been caused to buried cables.
- Do contact utility owner immediately if there is damage, however slight, to cable, electricity, gas, water or sewerage services.
- Do keep people well clear of damaged underground services until these are made safe.
- Do use sleepers, ballast or other means to protect rails from the tracked excavator when it is crossing tracks.
- Do equalise the load in side-tipping dumpers.

Don'ts

- Don't begin excavation works if unsure of the location of cable routes.
- Don't travel in the bucket of the machine.
- Don't stand behind the machine or walk on the blind side of the machine operator.
- Don't overload slings, chains or machines.
- Don't stand within slewing radius of excavators or next to a wall or fixed object within slewing radius of a machine (to avoid being crushed).

8.1 EXCAVATORS, DUMPERS, MINI-DIGGERS

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WORK METHOD

Before Going to the Site

1. Ensure that the local S&T supervisors have been advised, with minimum 3 weeks notice, of the excavation works. This is to allow arrangements for a survey and protection of cable routes.
2. Make sure that all cable routes are clearly marked and protected.
3. Check with your supervisor, with minimum 3 weeks notice, to arrange for a search of plans or other information on the location of other underground and overground services.
4. If other underground services are indicated, arrange with your supervisor for a survey of these using cable and pipe locating services to ensure they are marked, protected or diverted.

While at the Site

As appropriate to specific work activity

FUTURE FOLLOW-UP WORK

As appropriate to specific work activity

RELATED WORK INSTRUCTIONS

1.4 Transporting and Handling Rails Using Rail Trolleys/On-Track Machines
5.1 Cleaning and Maintaining Permanent Way Drainage
5.2 Mucky and Wet Spot Treatment
8.2 Mobile Cranes

INFRASTRUCTURE SAFETY STATEMENT REFERENCES

Refer to Infrastructure Safety Statement

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8.2 MOBILE CRANES

EQUIPMENT

Crane, Slings, Chains, Steel Rope,

Rope for Preventing Load Spinning

MATERIALS

Extra Sleepers for Support to Outriggers

SAFETY ARRANGEMENTS

Personal Protective Equipment (PPE) Required

Safety Footwear, Hi-Visibility Clothing, Suitable Gloves

Additional PPE Requirements

All Staff – hard hat

Minimum Warning Time (secs)

Not applicable

Protection Arrangements

TIII possession is required where there is a risk of the machine fouling the line or when loads are being lifted over the line.

Can traffic run on an adjacent track 6 ft away?

Yes, unless there is a risk of the operation encroaching on the adjacent line

RELATED WORK

(which may be carried out in conjunction with this work instruction but could require different protection arrangements)

As appropriate to work activity

GENERAL INFORMATION

The Divisional Engineer's representatives identify their lifting requirements and plan the operation in accordance *with IS 360:2004 Code of Practice for the Safe Use of Cranes in the Construction Industry*.

Overall control of the crane operation is co-ordinated by the certified appointed **crane co-ordinator** who must establish a safe system of work for all stages of the crane operation from planning to the departure of the crane from the site.

A method statement must be prepared in advance taking account of every stage of the crane operation.

DO'S AND DON'TS

Do's

- Do wear hard hats at all times when on site.
- Do make sure that all lifts are roped.
- Do check the location of all underground, above-ground and overhead services in the work site.
- Do check the suitability of the ground for outriggers.

Don'ts

- Don't attempt to lift an unbalanced load.
- Don't stand under loads.
- Don't stand next to a wall or fixed object when the crane is slewing (to avoid being crushed).

8.2 MOBILE CRANES

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WORK METHOD

As appropriate to specific work activity detailed in the method statement

FUTURE FOLLOW-UP WORK

As appropriate to specific work activity

RELATED WORK INSTRUCTIONS

Not applicable

INFRASTRUCTURE SAFETY STATEMENT REFERENCES

Refer to Infrastructure Safety Statement

Iarnród Éireann

9.1 TRACK JACKS

EQUIPMENT

Mechanical or Hydraulic Jack (obstructionless) with operating handle,

Secondary Support

MATERIALS

Not applicable

SAFETY ARRANGEMENTS

Personal Protective Equipment (PPE) Required

Safety Footwear, Hi-Visibility Clothing, Suitable Gloves

Additional PPE Requirements

Not applicable

Minimum Warning Time (secs)

25 secs (obstructionless jacks only)

Not applicable to mechanical jacks

(see Table 1 in Appendix A)

Protection Arrangements

TII or TIII possession or lookout protection appropriate to the task being undertaken

Can traffic run on an adjacent track 6 ft away?

Yes, with lookout protection

RELATED WORK

(which may be carried out in conjunction with this work instruction but could require different protection arrangements)

Resleepering. Packing joints. Mucky spot work etc.

GENERAL INFORMATION

Each jack must be marked with:

- Unique identification number
- Safe working load
- Date on which its next examination/test is due

New jacks must be registered and tested by a competent person before being used. A competent person is someone approved by the Divisional Engineer to carry out examinations, repairs and tests on jacks.

DO'S AND DON'TS

Do's

- Do ensure that jacks are inspected each day for any obvious damage or faults (including oil level). If faulty, notify the person in charge who will return the jack for repair.
- Do only use jacks within their safe working load and valid test period.
- Do use jack operating handles and not bars to operate jacks.
- Do set the jack straight to lift vertically and not at an angle pushing the rail out.
- Do take care, when working on curved and canted track, that the use of the jack does not compromise the track geometry.

Don'ts

- Don't place the jacks such that the handles are foul of the adjacent line when they are being used.
- Don't use defective jack operating handles suffering from splits and/or undue wear – replace them.
- Don't leave the handle in the jack when under load.
- Don't exceed the safe working load of the jack.
- Don't trip the jack using your foot – use the bar provided.

9.1 TRACK JACKS

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WORK METHOD

Before Going to the Site

1. *Note:* Obstructionless jacks do not form an obstruction of the line when placed under the rail. They therefore can be used with a minimum warning time of 25 seconds provided a track possession is not required for the particular work in hand.
2. *Note:* All mechanical jacks do form an obstruction of the line when placed under the rail. Mechanical jacks must therefore only be used in accordance with TII or TIII possessions.
3. Ensure the jack operates correctly before use, that the jack handle is not split or unduly worn, and that the jack is still within its test period.
4. Inspect the operating and carrying handles on the jack for damage. Ensure the jack handle can be inserted in and removed from the jack body location with ease.
5. Ensure working parts are clean.
6. Inspect for oil leakage before going to site and while in use.

While at the Site

1. When using jacks, always operate them from within the five foot to avoid fouling the adjacent line (if applicable).
2. When lifting track for packing etc., deploy 2 jacks in the same crib so that both rails can be lifted simultaneously – take care to avoid hitting each other's jack handles.
3. Both rails should, whenever possible, be lowered simultaneously.

FUTURE FOLLOW-UP WORK

Report any jack defects to the inspector, and label the jacks "Defective – NOT TO BE USED".

Check for track twist and slack after the work is complete.

RELATED WORK INSTRUCTIONS

1.2 Changing Rails in Jointed Track
2.1 Lubrication of Rail Joints
2.2 Repair and Shimming of Rail Joints
2.3 Packing of Rail Joints
2.4 Repair and Changing of Insulated Joints
3.1 Replacing Fangbolt Fastenings on Timber Sleepers
3.2 Manual Replacement of Timber Sleepers
4.1 Changing Older Type Common Crossings
4.2 Changing Turnout Switches
4.4 Replacing Broken Fishplates and Bolts in Points and Crossings
4.5 Manual Packing of Older Type Common Crossings
4.6 Conversion of Back-Hole Fishjoints to 4-Hole Joints
5.2 Mucky and Wet Spot Treatment
6.1 Correcting Top and Twist Faults

INFRASTRUCTURE SAFETY STATEMENT REFERENCES

Refer to Infrastructure Safety Statement

Iarnród Éireann

9.2 HAND-PROPELLED PER WAY TROLLEYS

EQUIPMENT

Hand Propelled Per Way Trolley,

Padlock and Chain or Fishplate (for securing when not in use),

Suitable Danger Signal:

- In Daylight – Red Flag
- At Night – Red Flashing Light

MATERIALS

As appropriate for work activity

SAFETY ARRANGEMENTS

Personal Protective Equipment (PPE) Required

Safety Footwear, Hi-Visibility Clothing, Suitable Gloves

Additional PPE Requirements

Not applicable

Minimum Warning Time (secs)

Not applicable

Protection Arrangements

TII or TIII possession, or in accordance with section S of the *Rule Book*

Can traffic run on an adjacent track 6 ft away?

Yes, with lookout protection

RELATED WORK

(which may be carried out in conjunction with this work instruction but could require different protection arrangements)

As appropriate for work activity

GENERAL INFORMATION

Per Way trolleys are used for the transport of materials and/or equipment. This instruction refers to hand-propelled trolleys – it does not cover machine-hauled trolleys.

Each trolley must be marked with:

- Unique identification number
- Tare weight and maximum carrying capacity (universally distributed)
- Date on which its next examination/test is due

Trolleys should be insulated if used in track-circuited areas.

DO'S AND DON'TS

Do's

- Do ensure that the trolley is stored clear of all railway lines, with its wheels chained and padlocked or fishplated to prevent its misuse.
- Do ensure that any loads carried by the trolley are distributed evenly over the trolley platforms as much as possible.
- Do ensure that the trolley has a means of stopping it running away when left stationary on the line – e.g. wheel checks and/or working handbrake.
- Do check, in advance, gradient where the trolley is to be used. Plan mode of work to reduce the risk of a runaway trolley.

Don'ts

- Don't overload the trolley beyond its maximum carrying capacity.
- Don't ride on the trolley.
- Don't tow or propel the trolley with machines.

9.2 HAND-PROPELLED PER WAY TROLLEYS

Iarnród Éireann

WORK METHOD

Before Use

1. Ensure the trolley is fit for use.
2. Check the brake is working and the wheels are not defective and/or cracked.
3. Ensure that wooden stops are available to secure unbraked trolleys if working on gradients.
4. Ensure that the lifting handles/points are in good condition and fit for purpose.

While in Use

1. Apply the mandatory requirements of the *Rule Book*.
2. Keep an eye on the load to ensure that it is not moving about or in danger of falling off the trolley.
3. Ensure that the load is secured and safe from becoming displaced when the trolley is moving.

FUTURE FOLLOW-UP WORK

Not applicable

RELATED WORK INSTRUCTIONS

1.4 Transporting and Handling Rails Using Rail Trolleys/On-Track Machines

INFRASTRUCTURE SAFETY STATEMENT REFERENCES

Refer to Infrastructure Safety Statement

Iarnród Éireann

9.3 POWER SPANNERS

EQUIPMENT

Power Spanner

MATERIALS

Fuel and Funnel

SAFETY ARRANGEMENTS

Personal Protective Equipment (PPE) Required

Safety Footwear, Hi-Visibility Clothing, Suitable Gloves

Additional PPE Requirements

Power Spanner Operators – ear defenders

(This PPE requirement applies to all staff within 3 m of operator)

Minimum Warning Time (secs)

TII or TIII possession required for *operating* power spanner

40 secs when *walking with* (not operating) power spanner on track under lookout protection (see Table 1 in Appendix A)

Protection Arrangements

TII or TIII possession when *operating* the power spanner

Can traffic run on an adjacent track 6 ft away?

Yes, with lookout protection

RELATED WORK

(which may be carried out in conjunction with this work instruction but could require different protection arrangements)

As appropriate to work activity

GENERAL INFORMATION

All power spanner operators MUST have attended the Small Plant and Equipment (SPE) Course.

Each power spanner must be marked with its unique identification number.

New power spanners must be registered and tested by a competent person before being used. A competent person is someone approved by the Divisional Engineer to carry out examinations, repairs, modifications and tests on power spanners.

Ensure that torque control is operational and correctly marked.

Note: 4 people are required to lift the power spanner as the weight of the machine prohibits fewer people from doing so. The Geismar TB2 machine weighs 142 kg.

DO'S AND DON'TS

Do's

- Do ensure that the power spanner is fit for use.
- Do obey the *Rule Book* requirements for travelling and working the power spanner (see above Safety Arrangements).

Don'ts

- Don't use the power spanner's trolley to transport any other items of equipment whatsoever – THIS PRACTICE IS STRICTLY FORBIDDEN.
- Don't fuel the power spanner unless it is switched off.
- Don't use split pins or wire rope and nails in the socket on the drive shaft to avoid snagging clothing etc.
- Don't refuel or touch any moving parts of the power spanner until it is switched off.

9.3 POWER SPANNERS

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WORK METHOD

1. Ensure all sockets/shoes/chucks required to operate the power spanner are with the machine and that they're not worn.
2. Remove sockets/shoes/chucks from the power spanner when it is not being used.
3. Make sure there is a trolley for every power spanner.
4. Make sure the power spanner is fully fuelled.
5. Inspect the power spanner to ensure it is in good working order.
6. Ensure the trolley and power spanner are secured.
7. Ensure that all lifts are made by 4 people and are planned.

FUTURE FOLLOW-UP WORK

Not applicable

RELATED WORK INSTRUCTIONS

1.1 Changing Rails in CWR (Rerailing)
1.2 Changing Rails in Jointed Track
1.6 The Use of Crank Rails in Jointed Track
1.7 Rail Stressing Operations
1.8 Repairs to Rails in CWR
2.2 Repair and Shimming of Rail Joints
2.4 Repair and Changing of Insulated Joints
2.5 Maintenance and Changing of Glued Joints
3.1 Replacing Fangbolt Fastenings on Timber Sleepers
3.2 Manual Replacement of Timber Sleepers
4.1 Changing Older Type Common Crossings
4.2 Changing Turnout Switches
6.1 Correcting Top and Twist Faults
6.2 Correcting Gauge Faults
10.2 Noise Abatement in Urban Areas

INFRASTRUCTURE SAFETY STATEMENT REFERENCES

Refer to Infrastructure Safety Statement

Iarnród Éireann

9.4 HAND-HELD POWER TAMPING TOOLS

EQUIPMENT

Hand-Held Power Tamping Tool (e.g. Cobra)

MATERIALS

Fuel

SAFETY ARRANGEMENTS

Personal Protective Equipment (PPE) Required

Safety Footwear, Hi-Visibility Clothing, Suitable Gloves

Additional PPE Requirements

Power Tamping Tool Operators – goggles, ear defenders

(These PPE requirements apply to all staff within 3 m of operator)

Minimum Warning Time (secs)

To be determined by protection arrangements

(see Table 1 in Appendix A)

Protection Arrangements

See specific work instruction for appropriate activity/site

Can traffic run on an adjacent track 6 ft away?

Yes, with lookout protection

RELATED WORK

(which may be carried out in conjunction with this work instruction but could require different protection arrangements)

Changing sleepers. Packing joints. Reballasting.

GENERAL INFORMATION

The exposure of any operator to the vibration of these machines must be limited to a maximum of 2 hours in any 8-hour period.

DO'S AND DON'TS

Do's

- Do report any defects to the person in charge.
- Do change operators regularly to limit the exposure of individuals to the vibration.

Don'ts

- Don't use a power tamping tool without a touch lookout and a safe system of work.

9.4 HAND-HELD POWER TAMPING TOOLS

Iarnród Éireann

WORK METHOD

Refer to appropriate work instruction activity

FUTURE FOLLOW-UP WORK

As appropriate to specific work activity

RELATED WORK INSTRUCTIONS

2.3 Packing of Rail Joints
2.4 Repair and Changing of Insulated Joints
2.5 Maintenance and Changing of Glued Joints
3.2 Manual Replacement of Timber Sleepers
4.5 Manual Packing of Older Type Common Crossings
5.2 Mucky and Wet Spot Treatment
6.1 Correcting Top and Twist Faults
10.2 Noise Abatement in Urban Areas

INFRASTRUCTURE SAFETY STATEMENT REFERENCES

Refer to Infrastructure Safety Statement

Iarnród Éireann

9.5 GENERATORS FOR LIGHTS, SAWS, DRILLS

EQUIPMENT

Generator (110 V)

MATERIALS

Fuel and Tundish (funnel for fuel)

SAFETY ARRANGEMENTS

Personal Protective Equipment (PPE) Required

Safety Footwear, Hi-Visibility Clothing, Suitable Gloves

Additional PPE Requirements

Not applicable

Minimum Warning Time (secs)

To be determined by protection arrangements

(see Table 1 in Appendix A)

Protection Arrangements

See specific work instruction for appropriate activity

Can traffic run on an adjacent track 6 ft away?

Yes, with lookout protection

RELATED WORK

(which may be carried out in conjunction with this work instruction but could require different protection arrangements)

As appropriate to work activity

GENERAL INFORMATION

Be careful lifting – plan all lifting and placement of generators, ensuring cables do not form a tripping hazard.

Ensure any new generator is tested/examined by a competent person.

Only 110 V generators may be used.

DO'S AND DON'TS

Do's

- Do ensure cable is connected to the correct voltage socket.
- Do wear gloves for lifting and refuelling as the generator will be hot.
- Do report any defects in generator or cables.

Don'ts

- Don't use in a confined area without proper ventilation of exhaust fumes.
- Don't leave any cables as a trip hazard.

9.5 GENERATORS FOR LIGHTS, SAWS, DRILLS

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WORK METHOD

1. Ensure generators are in good working order before leaving the depot.
2. The person in charge arranges for the fuel to be checked as necessary during the work.
3. Ensure that all cables and hoses are correctly folded and packed away for transport.

FUTURE FOLLOW-UP WORK

As appropriate to specific work activity

RELATED WORK INSTRUCTIONS

All work instructions covering the use of electrically powered equipment

INFRASTRUCTURE SAFETY STATEMENT REFERENCES

Refer to Infrastructure Safety Statement

Iarnród Éireann

9.6 VIBRATING PLATES AND ROLLERS

EQUIPMENT

Vibrating Plates, Vibrating Rollers (hand-operated or sit-on type)

MATERIALS

Fuel

SAFETY ARRANGEMENTS

Personal Protective Equipment (PPE) Required

Safety Footwear, Hi-Visibility Clothing, Suitable Gloves

Additional PPE Requirements

Vibrating Plate Operators – ear defenders

Vibrating Rollers Operators – ear defenders

(These PPE requirements apply to all staff within 3 m of operators)

Minimum Warning Time (secs)

To be determined by protection arrangements

(see Table 1 in Appendix A)

Protection Arrangements

TIII possession when working on or near the track

Can traffic run on an adjacent track 6 ft away?

Yes, unless there is a risk of the machine fouling the line

RELATED WORK

(which may be carried out in conjunction with this work instruction but could require different protection arrangements)

As appropriate to work activity.

Compacting formation at level crossings.

GENERAL INFORMATION

Ensure the person accepting delivery familiarises themselves with the operation (starting and stopping) and safe use of the machine.

Make sure the machine is working correctly before beginning work.

Use an approved hire plant company.

DO'S AND DON'TS

Do's

- Do check location of any cables and services before compacting.
- Do ensure adequate fuel for work.

Don'ts

- Don't operate vibrating equipment without checking with the person in charge that site conditions are adequate.

9.6 VIBRATING PLATES AND ROLLERS

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WORK METHOD

Refer to appropriate work instruction activity

FUTURE FOLLOW-UP WORK

As appropriate to specific work activity

RELATED WORK INSTRUCTIONS

10.2 Noise Abatement in Urban Areas

INFRASTRUCTURE SAFETY STATEMENT REFERENCES

Refer to Infrastructure Safety Statement

Iarnród Éireann

9.7 RAIL SAWS

EQUIPMENT

Disc Saw (with spare discs), Clamp, Spanner, Tensors if required

MATERIALS

Fuel

SAFETY ARRANGEMENTS

Personal Protective Equipment (PPE) Required

Safety Footwear, Hi-Visibility Clothing

Additional PPE Requirements

Disc Saw Operators – flame-retardant overalls, spats, dust mask, goggles, ear defenders, suitable gloves

(These PPE requirements apply to all staff within 3 m of operators)

Minimum Warning Time (secs)

To be determined by protection arrangements

(see Table 1 in Appendix A)

Protection Arrangements

See specific work instruction for appropriate activity/site

Can traffic run on an adjacent track 6 ft away?

Yes, with lookout protection

RELATED WORK

(which may be carried out in conjunction with this work instruction but could require different protection arrangements)

As appropriate to work activity

GENERAL INFORMATION

All rail saw operators MUST have attended the Small Plant and Equipment (SPE) Course.

There is a risk of the disc shattering so always wear correct PPE in the vicinity of an operating disc saw.

DO'S AND DON'TS

Do's

- Do stand clear of the saw while it is in use. There is a risk of burns and damage to eyes from sparks generated.
- Do only use the saw with a rail clamp when cutting nuts.
- Do use tensors (if CWR track) before cutting rail to avoid jamming the disc saw or tearing the foot of the rail.
- Do break used discs after use (to avoid reuse).
- Do refuel saw well clear of worksite to avoid sparks and hot material.

Don'ts

- Don't allow the operator to fuel the saw. If fuel is spilled, sparks and hot material on clothing may catch fire.
- Don't transport the saw with the disc attached.

9.7 RAIL SAWS

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WORK METHOD

Before Use

1. Check the machine is in good order.
2. Check the guard is free from filings and that the disc is free-running by rotating the disc by hand.
3. Ensure the disc is centred in the machine.
4. Ensure that sufficient discs are available for the proposed work.
5. Ensure that sufficient fuel is available for the proposed work.
6. Ensure the disc saw is filled with fuel before use.
7. Check the spanner is suitable.
8. Check the clamp is tightened and secure.
9. Check the rail being cut is secured.
10. Use only authorised discs.

During Use

1. Clean the guard at every change of disc.
2. Look for the rail closing in on the disc while cutting. Stop and seek assistance from the person in charge if this occurs.

FUTURE FOLLOW-UP WORK

As appropriate to specific work activity

RELATED WORK INSTRUCTIONS

1.1 Changing Rails in CWR (Rerailing)
1.2 Changing Rails in Jointed Track
1.6 The Use of Crank Rails in Jointed Track
1.7 Rail Stressing Operations
1.8 Repairs to Rail in CWR
2.5 Maintenance and Changing of Glued Joints
4.1 Changing Older Type Common Crossings
4.2 Changing Turnout Switches
10.2 Noise Abatement in Urban Areas

INFRASTRUCTURE SAFETY STATEMENT REFERENCES

Refer to Infrastructure Safety Statement

Iarnród Éireann

9.8 RAIL DRILLS

EQUIPMENT

Rotabroach or Geismar Boring Machine,
Drill Bits, Allen Keys, Templates,
Guide Bars, Spanners, Measuring Tape

MATERIALS

Fuel,
Water if Geismar or
Cutting Fluid if Rotabroach

SAFETY ARRANGEMENTS

Personal Protective Equipment (PPE) Required

Safety Footwear, Hi-Visibility Clothing, Suitable Gloves

Additional PPE Requirements

Drill Operators – goggles, ear defenders

(These PPE requirements apply to all staff within 3 m of operators)

Minimum Warning Time (secs)

To be determined by protection arrangements

(see Table 1 in Appendix A)

Protection Arrangements

See specific work instruction for appropriate activity/site

Can traffic run on an adjacent track 6 ft away?

Yes, with lookout protection

RELATED WORK

(which may be carried out in conjunction with this work instruction but could require different protection arrangements)

As appropriate to work activity

GENERAL INFORMATION

All rail drill operators MUST have attended the Small Plant and Equipment (SPE) Course.

DO'S AND DON'TS

Do's

- Do report defects with drill to the person in charge.
- Do ensure correct guides and templates are used.

9.8 RAIL DRILLS

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WORK METHOD

Before Use

1. Examine drill bits before use.
2. Ensure there is adequate fuel to carry out the proposed work (including a supply of fuel on site).
3. Ensure the correct guides and templates for the work are brought to site.
4. Ensure the size of the drill bit is correct for the diameter of the required hole.

During Use

1. Use cutting fluid (if Rotabroach) or water (if Geismar) when cutting.

FUTURE FOLLOW-UP WORK

As appropriate to specific work activity

RELATED WORK INSTRUCTIONS

1.2 Changing Rails in Jointed Track
1.6 The Use of Crank Rails in Jointed Track
4.1 Changing Older Type Common Crossings
4.2 Changing Turnout Switches
4.6 Conversion of Back-Hole Fishjoints to 4-Hole Joints
10.2 Noise Abatement in Urban Areas

INFRASTRUCTURE SAFETY STATEMENT REFERENCES

Refer to Infrastructure Safety Statement

Iarnród Éireann

9.9 FUELLING ENGINE-POWERED MACHINES

EQUIPMENT

Appropriate container (labelled) for the fuel being used,

Fuel filler funnel (if necessary),

Foam Fire Extinguisher (class AFFF)

MATERIALS

Correct fuel for the machines in use

SAFETY ARRANGEMENTS

Personal Protective Equipment (PPE) Required

Safety Footwear, Hi-Visibility Clothing, Oil-Resistant Gloves

Minimum Warning Time (secs)

Not applicable

Protection Arrangements

Not applicable

Can traffic run on an adjacent track 6 ft away?

Not applicable

RELATED WORK

(which may be carried out in conjunction with this work instruction but could require different protection arrangements)

All work with engine-powered plant.

GENERAL INFORMATION

Never smoke in the vicinity of fuels.

Always shut down an engine before adding fuel to it.

Make sure that any container holding fuel is clearly labelled with the name of the fuel.

Always follow the manufacturer's recommendations for fuelling a machine.

Only fuel in open or well-ventilated areas.

Avoid inhaling fuel fumes.

DO'S AND DON'TS

Do's

- Do report all defects or suspected fuel leaks to the supervisor.
- Do use approved personal protective equipment when handling fuel, i.e. oil-resistant gloves.
- Do keep an AFFF foam fire extinguisher nearby and know how to use it.
- Do shut down engine before fuelling and allow to cool down.
- Do change your clothes immediately if fuel is spilled on them.
- Do keep a first-aid kit nearby in case of injury.

Don'ts

- Don't smoke in the vicinity of fuels or when fuelling a machine.
- Don't fuel a machine close to any source of ignition, e.g. sparks.
- Don't use a container which does not have the fuel clearly labelled on it.

9.9 FUELLING ENGINE-POWERED MACHINES

Iarnród Éireann

WORK METHOD

1. Examine the machine to ensure the correct fuel-filling point.
2. Check which is the correct fuel for that machine, e.g. petrol, diesel, two-stroke mixtures.
3. Remove the fuel-filler cap from the engine fuel tank and container.
4. Carefully pour fuel into the engine fuel tank taking all precautions to avoid spillage. Use a funnel if appropriate.
5. When finished, replace the filler caps tightly on the engine fuel tank and the container.
6. Clean up any spilled fuel before starting up the engine.
7. Clean up all worksites if fuel is spilled. Remove any fuel-soaked materials and dispose of them in a proper manner.

FUTURE FOLLOW-UP WORK

Not applicable

RELATED WORK INSTRUCTIONS

All those which include engine-powered machines

INFRASTRUCTURE SAFETY STATEMENT REFERENCES

Refer to Infrastructure Safety Statement

Iarnród Éireann

10.1 SITE LIGHTING ARRANGEMENTS

EQUIPMENT

Hard Hats Fitted with Miner's Lamps

AT WORK SITE:

Portable 110 V Generator and Lighting Set (and access to spare fittings)

Note: Additional lighting may be provided by lights attached to machines (e.g. power spanners or excavators)

MATERIALS

Fuel for Generator (minimum 2-gallon can required, per generator per shift),

Tundish (funnel) for filling generator with fuel

SAFETY ARRANGEMENTS

Personal Protective Equipment (PPE) Required

Safety Footwear, Hi-Visibility Clothing, Suitable Gloves

Additional PPE Requirements

Not applicable

Minimum Warning Time (secs)

To be determined by protection arrangements

(see Table 1 in Appendix A)

Protection Arrangements

Protection arrangements for the erection of lighting are applicable to specific work.

If bogeying equipment and materials, a TIII possession is required.

Can traffic run on an adjacent track 6 ft away?

Yes, with lookout protection

RELATED WORK

(which may be carried out in conjunction with this work instruction but could require different protection arrangements)

As appropriate to work activity

GENERAL INFORMATION

Before work begins, the site should be visited in daylight to check for cables, obstructions etc.

Ensure that others who may be affected by the night work (e.g. Signal & Telecoms) are aware of what work is planned.

DO'S AND DON'TS

Do's

- Do use existing fixed lighting if available.
- Do use a tundish (funnel) for filling generator fuel tanks.
- Do use baskets, tripods or fixed brackets, if available, in preference to ground spikes. Ground spikes are not to be used unless clearance has been given that there are no Signal & Telecoms cables in the way.
- Do test all lighting sets thoroughly prior to the night work. Carry spare bulbs and ensure that you know how to change them correctly in a safe manner.
- Do run cables neatly and always under (never over) the rail.
- Do arrange for steel plates or similar to cover and protect cables for site lighting from excavators, diggers etc. travelling over them.
- Do ensure that all lighting generators are 110 V.
- Do position the generator such that the effect of its noise and/or fumes upon neighbours and staff is minimised.
- Do position lighting securely and safely and check, especially with Signal & Telecoms regarding their cables and routes, if mast lighting with ground spikes is to be used.

10.1 SITE LIGHTING ARRANGEMENTS

Iarnród Éireann

WORK METHOD

1. Identify the person in charge for the work group and take instructions as to the work activity.
2. Arrange protection.
3. Ensure that at least 1 member of the gang has been trained in the maintenance and care of lighting equipment.
4. If possible, use festoon lighting for stressing operations in CWR.
5. Use "Till Dawn" lighting to illuminate areas where the gang is unloading/loading vans and materials etc. Consider also the possibility of using suitable mounted lights upon vans to assist such operations.
6. Position and start up lighting.
7. Ensure lighting shines downwards and not into people's and drivers' faces.

FUTURE FOLLOW-UP WORK

Not applicable

RELATED WORK INSTRUCTIONS

9.5 Generators for Lights, Saws, Drills

10.2 Noise Abatement in Urban Areas

INFRASTRUCTURE SAFETY STATEMENT REFERENCES

Refer to Infrastructure Safety Statement

Iarnród Éireann

10.2 NOISE ABATEMENT IN URBAN AREAS

EQUIPMENT

Motorised Equipment such as

Disc Saws, Power Spanners, Angle Grinders, Generators

MATERIALS

As appropriate to work activity

SAFETY ARRANGEMENTS

Personal Protective Equipment (PPE) Required

Safety Footwear, Hi-Visibility Clothing, Suitable Gloves

Additional PPE Requirements

All Staff – see specific work instruction for appropriate items required

Minimum Warning Time (secs)

When working with noisy equipment, note that communication by touch may be essential if wearing ear defenders. Consult Track Safety Co-ordinator.

(see Table 1 in Appendix A)

Protection Arrangements

See specific work instruction for appropriate activity/site

Can traffic run on an adjacent track 6 ft away?

Yes, with lookout protection

RELATED WORK

(which may be carried out in conjunction with this work instruction but could require different protection arrangements)

As appropriate to work activity

GENERAL INFORMATION

Permanent way equipment and operations can generate undue noise in an urban environment.

In general, divisional office staff forewarn residents of impending noisy operations taking place at night by circulating explanatory leaflets.

Daytime operations are not generally problematic. Mobile gangs must, however, still act with due consideration for residents and minimise their noise.

Always leave the site clean and tidy.

DO'S AND DON'TS

Do's

- Do keep as quiet as possible when entering or leaving the site.
- Do keep road vehicles parked with consideration for residents, and avoid running vehicle engines whenever possible.
- Do position generators where their noise will be reflected away from housing, or where it will be screened by vegetation or railway buildings.
- Do minimise the use of rail saws at night – cut in daytime if possible.
- Do check that the silencer of any equipment is not defective and is fit for purpose.
- Do be courteous to neighbours/residents and explain the essential nature of this safety-related work.
- Do remember that any sound at night "when all is quiet" carries for considerable distances.

Don'ts

- Don't shout or raise voices unless absolutely vital to safe operations.
- Don't leave vehicle radio playing at night.

10.2 NOISE ABATEMENT IN URBAN AREAS

Iarnród Éireann

WORK METHOD

The following items should be included with the appropriate work method for the activity to be undertaken:

1. Inspect the worksite in daylight if possible, and look for the best location to site generators:
   - Screen directly from housing behind vegetation or railway buildings
   - Consider using additional supply cables and structures so that the generators can be positioned as far away from housing as is practicable
2. Carry out as much preparatory work in daylight as possible (sawing or drilling rails).
3. Carry out night time operations as quietly as possible, avoid shouting.
4. Have with you a copy of the explanatory leaflet circulated to residents, to help explain to any complainants that Iarnród Éireann is doing its best to minimise noise disturbance to residents and that the work being undertaken is essential and for safety purposes.

FUTURE FOLLOW-UP WORK

Not applicable

RELATED WORK INSTRUCTIONS

All work undertaken by the mobile gang has the potential to create noise.

INFRASTRUCTURE SAFETY STATEMENT REFERENCES

Refer to Infrastructure Safety Statement

Iarnród Éireann

10.3 DUST AND SMOKE

EQUIPMENT

As appropriate to work activity

MATERIALS

As appropriate to work activity

SAFETY ARRANGEMENTS

Personal Protective Equipment (PPE) Required

Safety Footwear, Hi-Visibility Clothing, Suitable Gloves

Additional PPE Requirements

All Staff – dust masks, goggles

Protection Arrangements

See specific work instruction for appropriate activity/site

Minimum Warning Time (secs)

Dust and smoke can seriously reduce visibility so sighting distances will also be reduced. In circumstances where the lookout's sighting distance (or that between gang and lookout) is seriously affected, alternative safety arrangements must be made (e.g. TII or TIII possession), or work stopped. Consult Track Safety Co-ordinator.

(see Table 1 in Appendix A)

Can traffic run on an adjacent track 6 ft away?

Yes, with lookout protection

RELATED WORK

(which may be carried out in conjunction with this work instruction but could require different protection arrangements)

As appropriate to work activity

GENERAL INFORMATION

Dust is generated by: disc saw; ballast regulator and ballast teeming/ploughing/cleaning; hedge cutting; rail grinding; rail traffic; road traffic; bridge cleaning; blasting/demolition works.

Smoke is generated by: Thermit welding; rail grinding; burning; farming; industrial activities.

DO'S AND DON'TS

Do's

- Do wear dust masks whenever involved in major disturbances of track ballast, e.g. ballast cleaning, ploughing, regulating, or offloading ballast.
- Do blow ballast dust off spectacles etc. before cleaning or polishing to avoid scratching lenses.
- Do try and reduce your exposure to airborne dust, fumes and smoke by working upwind of the source where possible.
- Do be careful of dust getting into Signal & Telecoms location boxes etc. Secure location box doors temporarily when teeming ballast.
- Do advise your supervisor if dust and smoke is generating a particular hazard.
- Do recognise that smoke can have the same effect upon visibility as fog or falling snow.
- Do turn your back to passing traffic and gather clothes to avoid dust etc. and flying particles.
- Do clean flangeways and running tables of dust that has been produced during the work activity.

Don'ts

- Don't inhale dust or smoke (if avoidable). Make use of dust masks and other PPE.
- Don't work in confined spaces without a safe system (specialist advice is required on this).

10.3 DUST AND SMOKE

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WORK METHOD

1. Establish the likelihood and duration of any dust or smoke being generated on a mobile gang's worksite.
2. Determine whether the mobile gang can undertake other work of equivalent priority on a site elsewhere, thereby avoiding dust and smoke problems.
3. If the gang must work in a dusty and/or smoky environment:
   - Ensure that the safety protection arrangements (especially lookouts) are still able to see approaching traffic properly, and are also capable of communicating properly with the mobile gang
   - Ensure that the gang work on the upwind side of the source of dust or smoke wherever possible
   - Ensure that the gang wear dust masks if dust is being generated, or is likely to be generated
4. Follow the work method for the specific work activity.

FUTURE FOLLOW-UP WORK

On sites (e.g. industrial) where smoke etc. is being generated daily and thereby causing safety problems (poor visibility etc.), consider the option of re-planning the work via different safety protection arrangements, i.e. TII or TIII possessions.

RELATED WORK INSTRUCTIONS

This is relevant to most work instructions in this standard.

INFRASTRUCTURE SAFETY STATEMENT REFERENCES

Refer to Infrastructure Safety Statement

Iarnród Éireann

11.1 CLEANING OF MOBILE GANG FACILITIES, WORKSITES, STAFF CARS, VANS AND LORRIES

EQUIPMENT

As appropriate for specific job

MATERIALS

As appropriate for specific job

SAFETY ARRANGEMENTS

Personal Protective Equipment (PPE) Required

Safety Footwear, Hi-Visibility Clothing, Suitable Gloves

Additional PPE Requirements

All Staff Carrying Out Cleaning – face masks and other PPE may be required depending on materials/substances used

Minimum Warning Time (secs)

Not applicable

Protection Arrangements

Not applicable

Can traffic run on an adjacent track 6 ft away?

Not applicable

RELATED WORK

None

GENERAL INFORMATION

Supply of consumables is organised by the person in charge.

Facilities should be kept in a clean and tidy condition and good hygiene should be observed in the canteen, vans, staff cars and lorries.

Check staff cars and vans are in good order before use.

DO'S AND DON'TS

Do's

- Do report all faults to the supervisor.
- Do refer to relevant safety instructions on the containers of cleaning materials.
- Do use approved protective equipment when cleaning up hazardous materials (e.g. chemicals, sharp objects, infectious material).
- Do clean up all worksites. Remove any rubbish and dispose of it in a proper manner.

Don'ts

- Don't litter vans, canteen, staff cars, lorries or worksites.

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WORK METHOD

As appropriate for facilities being cleaned

FUTURE FOLLOW-UP WORK

Repeat as necessary

RELATED WORK INSTRUCTIONS

Not applicable

INFRASTRUCTURE SAFETY STATEMENT REFERENCES

Refer to Infrastructure Safety Statement

APPENDIX A MINIMUM WARNING TIMES, PERSONAL PROTECTION EQUIPMENT (PPE)

Table 1: Minimum Warning Times

PERMISSIBLE SPEED (MPH)	SIGHTING DISTANCE IN METRES TO PROVIDE MINIMUM WARNING TIME IN SECONDS (secs)						
	15 secs	20 secs	25 secs	30 secs	35 secs	40 secs	45 secs
100	700	900	1200	1400	1600	1800	2100
90	700	900	1100	1300	1500	1700	1900
75	600	700	900	1100	1200	1400	1600
60	500	600	700	900	1000	1100	1300
40	300	400	500	600	700	800	900
20	200	200	300	300	400	400	400

Table 2: Additional Personal Protection Equipment (PPE)

Standard PPE for mobile gang work: safety footwear, hi-visibility clothing, suitable gloves.

The table below gives the additional PPE required for certain activities.

Activity	Extra Equipment Required
Angle Grinder Operators	Flame-retardant overalls, spats, suitable dust mask, goggles, ear defenders, suitable gloves
Beater Operators	Goggles
Cement Mixer Operators	Dust mask, goggles, ear defenders
Chainsaw Operators	Combination helmet (head protection and visor), chainsaw protective trousers with ballistic nylon, special protective boots, special protective gauntlets
Disc Saw Operators	Flame-retardant overalls, spats, dust mask, goggles, ear defenders, suitable gloves
Flame Cutting Operators	Flame-retardant overalls, spats, spark-resistant gauntlets, flame cutting goggles, ear defenders
Hand-Held Power Tamping Tool Operators	Goggles, ear defenders
Power Spanner Operators	Ear defenders
Rail Drill Operators	Goggles, ear defenders
Sleeper Boring Machine Operators	Goggles, ear defenders
Vibrating Equipment Operators	Ear defenders
Winch Motor Operators	Ear defenders